SCIENTIFIC RELIGION

Being

Lecture Notes for a Series of Talks.

VOL. II.

MAN KNOW THYSELF

BY

G. N. GOKHALE, B. SC., L. C. E., M. I. E. (Ind.),

Indian Service of Engineers (Retired.),

Principal,

Nadirshaw Edulji Dinshaw Civil Engineering College

Karachi.

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Humbly dedicated to

A. B.

of whose wisdom this book is
but a faint reflection.

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INTRODUCTION

My reasons for publishing these notes were explained in the Introduction to Volume I. I would like to add that the talks at the Nadirshaw Edulji Dinshaw Civil Engineering College continue; and I feel very happy, when I hear from some past student as to how he still remembers the College by the "Terrace Talks," when other subjects have faded from his memory. That reminds me of the definition of Education as "that which remains behind when everything else you learnt is forgotten."

Since the publication of that booklet, the question was discussed in the Senate of the Bombay University, when I was told that in those 140 pages I had failed to convey an idea of what I meant. This Volume goes into greater details; and I may be permitted to hope that I may succeed better this time, at least with people, who can spare the time to go through it. Prof. Eddington, F. R. S. from sacred Cambridge was once asked whether Science could not furnish an argument which ought to convince any reasonable atheist. He replied: "I could no more ram religious conviction into an atheist than I could ram a joke into a Scotchman. The only hope of converting the latter is that through contact with

merry-minded companions he may begin to realise that he is missing something in life, which is worth attaining. Probably in the recesses of his solemn mind there exists inhibited the seed of humour, awaiting an awakening by such an impulse." I ask for no more than the creation of a similar atmosphere, in which Science and Religion are but the two sides of the same shield.

I beg of my Rationalist friends that they should be a little more "Rational." They would also do well to reconsider the advisability of banishing Emotion from the world—an utterly futile attempt. Communalism is no more the result of Religion, than the poison-gases are the product of Science. Both are rooted in unregulated Emotion, which people try to hide behind Religion and Science; and in my humble opinion, the first step towards improvement is to tear off that mask by showing that all Religions are essentially one and cannot possibly be superior and inferior. My Religion is no doubt best for me, but I have no right whatsoever to thrust it on another. That is the second half of my proposal.

We have before us materialistic Science on one side and dogmatic Religion on the other. We must steer clear of both rocks, which are equally dangerous, and I am convinced more than ever, that the only remedy is "Scientific Religion", or whatever other name you may choose to call it by.

That is the message I would like my Motherland to give the whole world *by practising it*, on the rosy dawn of Her freedom; and if that is also God's will, it shall be done.

I am deeply indebted to all the perons from whose gardens I have stolen the flowers, I have tried to string together in these pages. If I have put in some thorns, that is my fault. Even the thread, I owe to the ONE to whom these notes are humbly dedicated.

Karachi,
17th February 1932. G. N. GOKHALE.

SUMMARY OF VOLUME ONE

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In our search for an answer to the eternal questions "Who am I? Whence did I come? Whither am I going?" we first defined our attitude towards these deeper problems of life, which sooner or later confront every man. We decided to approach the subject as seekers of truth in a perfectly scientific manner, accepting no authority, but ready to examine every point of view.

We first assumed ourselves to be mere fortuitous concourse of atoms and saw how its logical consequences were not acceptable to our "Inner man." We then went through a number of facts like Change of personality, Hysteria, Sudden loss of memory, talking in an unknown tongue, Hypnotism, Mesmerism, etc. facts which have been studied in a thoroughly scientific manner, and which do call for an explanation, which a mere materialistic theory of Life fails to give. "Do the dead die" was naturally our next question, and I tried to recapitulate why a man like Lodge feels convinced that "the dead do not die." I then attempted to show that the present day antagonism between Religion and Science was only a natural—but not therefore Scientific—result of the persecution of Science by Religion in Europe. We saw how Religion alone gives a sanction which a mere code of morals lacks. We then had a birds-eye-view of the principal Religions of the world, beginning with the Sanâtana

Dharma the oldest. I showed how Islam, the youngest preached nothing different, and how the trouble between Hindus and Moslems are analogous to the bickerings we have between the older and younger generations in every family, and how a little more understanding is all that is required. Then we took Sikhism—that noblest attempt at uniting Hindus and Moslems. We then saw the beauties of Christianity, the religion of the West. After a short survey of Jainism—the religion of method and Zorastrianism, the Gospel of Purity, we saw how Lord Buddha simplified everything and laid down what may be called the basis of a Scientific Religion. We thus verified how very similar the teachings of all religions are, and how certain great truths emerge out of the din of dogmas, which give us a fairly .satisfactory answer to the questions we started with.

I tried to make out a case that there is no separate Science, and Religions *in the plural* have no existence. It is all Religion—the Science of Life. I ended by entreating my countrymen seriously and calmly to consider, whether all that is "dirt that must be thrown on the scrap heap."

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The numbering of Chapters and paragraphs has been continued from Volume I, for easy reference.

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Now Read on.

VOL II. MAN KNOW THYSELF

XVII MAN THE MACHINE

165. World Problem an individual Problem.

Having taken a bird's-eye-view of the Universe from both ends, we shall now try to obtain a closer view of "Man" as a type. A great thinker asserts that the world-problem is essentially the problem of the individual; and the world will progress in reality, only when each member of Society looks within himself, understands his own problems, aims at a higher standard and attains it. Diversity is the essence of creation, and each individual necessarily differs from others. No two men—not even two brothers born of the same parents and brought up under the same roof—are the same in all respects. They may eat the same food, and yet their bodies will develop differently. The contents of their minds will vary very greatly. Their tastes, their way of looking at things, their power of understanding, their ideals in life, will not be the same; and one hard and fast rule will never serve even these brothers. The circumstances which surround them will further present different problems, which will demand different solutions. Each individual will have to find out his own way. And yet these diverse individuals make up the

world. As the common saying goes, they all live by "washing each other's linen" ; and their activities are all complementary. No entity is born, but has a distinct role to play on the world's stage, and if only each one played his own part perfectly, it would be unnecessary to look for a paradise *after* death. Before an actor can do justice to his part, he must know that he is not the puny patāwālā or the poor primary school teacher, but an individual unit, with Divine possibilities. And that is why, the ancient philosophers wrote on the doors of the temple at Delphi "MAN KNOW THYSELF." We shall try to follow this advice.

166. Colour of Skin

When we take a closer view of man the first thing that strikes us naturally is his appearance, in which the colour of his skin has somehow assumed an importance all its own. If some men are white, a great many have darker skin, and a very large number have skin of a yellowish hue. In olden times all these groups used to live in different parts of the globe, under varying climatic conditions ; but the modern improvements in communications have thrown them all together. Hence the "whiteman's burden", the "black menace", and the "yellow peril." The white races who live in colder countries have necessarily to bustle about, if only to keep warm. They have to consume more food to get the required heat ; they put on more clothing to preserve it, and must have better houses for the same purpose. Fortu-

nately they can work longer hours in their climate without fatigue. On the whole, they are a very industrious people. They developed modern science to its present pitch, and the "Power machine" was born in their midst. All these factors have enabled them to obtain mastery over multitudes who live in hotter regions, where labour is tiring, where men can get on with less food, less clothing, and where they can live out of doors for a great part of the year. These are naturally more lethargic than their shivering cousins. Moreover their philosophers have taught them for ages that they are Immortal Souls, for whom this earth is but a temporary abode, and that gives them no better incentive. They were therefore content to live an easy contemplative life, until the busy bees from the West invaded their tropical gardens. After a century's contact with them, and having tasted the sweet honey collected by the Westerners, the Orientals have begun to feel that they too might try to make the best of their short stay in this world. Their minds are unsettled. They are getting determined to gather their own honey from their own gardens; and they are really becoming a "Menace" and a "Peril" to the busy bees. But there is nothing "dark" or "yellow" about it.

167. Colour not even skin-deep.

The colour of the skin is only due to a thin layer of pigment in the skin and is not even skin-deep. That is one of nature's contrivances for protecting the inside from the rays of the Sun; and even a few days of exposure to the tropical Sun

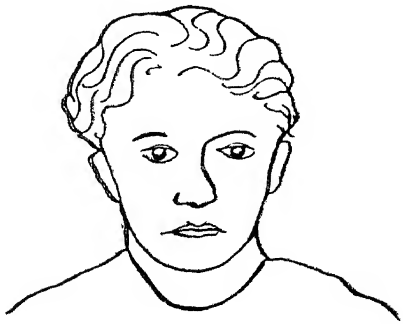
vill darken a fair skin. Tanning the skin in this way is almost a craze in Southern Europe; but all this browning is comparitively temporary. It s only after hundreds of generations that we levelop a really fast colour; but even this ›igmentation derived through heredity from cen- ›uries gets dissolved in leucoderma, without affect- ng the person in any other way. The chameleon ›an change its colour from pale yellow to brilliant ;reen or red in a moment, and yet it remains the ›ame animal. The colouring helps the chameleon ›o get mixed up in his surroundings, and the man ›o withstand heat and perhaps to set up a new ›tandard of beauty, but it is all an accident. and ›annot determine once and for all time the ›haracter of the inner man.

168. The Dark, Yellow and White races.

Not only do people differ in the colour of their skin, but in other respects as well. Mankind on the whole is a conglomorate in which all sorts of characteristics are mixed up; and a really pure type is very rare. Yet on a careful analysis we can divide mankind into three great Races, which we may call (1) The Dark, (2) the Yellow and (3) the White. The marked characteristics of each race are given in Diagram (I) and need not be repeated here. Some of these features are no doubt the result of environment, but no one now considers the old theory of natural selection sufficient to explain the whole process of evolution. People have been shaving their heads clean for the last three thousand years, and yet their off-

DIAGRAM I

	DARK I	WHITE III	YELLOW II
SKIN	DARK	FAIR	YELLOW
HAIR	WOOLLY	STRAIGHT CURLY	STRAIGHT
BEARD		WELL-DEVELOPED	
CHEEK-BONE			BROAD
EYES	PROMINENT		SUNKEN
NOSE	BROAD	NARROW	SMALL
LIPS	THICK	SMALL (PROMINENT	
TEETH	LARGE	SMALL	MODERATE



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springs are born with hair just as before. The prominent lips, narrow eyes, or the aquiline nose are not the result of mere climate, nor are they only acquired characteristics. They do point to something beyond. By judicious breeding, we have been able to develop hundreds of distinct varieties of particular plants within a man's lifetime, and who knows that some Superman may not be carrying out similar experiments with human beings, and trying to copy some Archetypes set before them. as Plato suggested. If such Beings exist, they must obviously be capable of watching the results of their labours, extending over generations. If the Inner man is really immortal and has risen above physical life and death as we understand it, there would be nothing absurd or improbable about this.

169. Races differ greatly.

Not only do the various races differ in their external appearance as stated above, but their very nervous system seems to be distinctly constituted. Writing of Japanese Soldiers, says Col. Hefir :— "In 1894 they bivouaced on frozen ground. They marched in the face of driving winds and blizzards for miles and miles over stony ground slippery with ice or frozen sleet or snow, starting at 2 or 3 A.M. daily, and frequently not ending their march until late at night. Some of them even marched under such conditions with frost-bitten feet, their worn-out shoes offering no protection..... It is well-known how the Japanese bear pain wonderfully. In hospitals at

Port Arthur, little Anaesthesia was adopted even in large and long operations." No doubt some of this hardihood can be understood, when we remember that burning cones of incense on the child's hand till the fire ate into the flesh was a common punishment in Japanese Schools, only a few years ago; but it is not all an acquired virtue. It is a characteristic of all the yellow races; and perhaps is a feature of the Archetype after which these races were modelled.

170. Other races as well endowed as the white.

These racial characteristics are all facts in nature, and they will make certain things easier and others more difficult for the man; but they cannot possibly determine all that a man is. That is why Shylock asked if a Jew hath no feelings. It has been proved, that the most notable of human virtues are richly represented among the Esquimaux, who eat raw flesh; and it is even probable that no one has more admirably developed his intelligence for solving the practical problems of life, than the Red Indian, whose observation, courage, resource, memory, and inventiveness have won innumerable tributes from travellers. The Negro and Kafir are not generally credited with the same virtues but it must be remembered that till very lately they were regarded as goods and chattel, and the prejudice against them in the eyes of their erstwhile "masters" is not easy to wipe out. If the races are real Types and not mere milestones on the path of evolution, it is not improbable that

the Negroes are not the links between the Ape and the White man, as some people suppose, but only the remnants of a once-glorious but dark-skinned race, who could perhaps boast of a civilization as good as our own, at least in some respects.

171. Better bodies bring greater responsibilities.

If we accept the theory that the body is a vesture for the immortal spirit within, a machine through which he works, it will certainly help or hinder the Inner man. Bodies of different races would be like different musical instruments in different state of repair. The best musician will not be able to get exactly the same notes out of each, and even he will find it difficult to get much out of them, if you insist on his putting on a pair of wicket-keeper's gloves. But a Tānsen or Beethoven will any time do better than others. A musician who can get tolerable music out of a broken violin deserves more credit than another who does equally well with a new one, in perfect tune. Race does exist, and yet racial pride would seem to be no better than the satisfaction one might legitimately feel in having a better violin. At the same time, we have to remember that we have obtained this instrument by the mere accident of birth in a certain family. The better the race I am born of, the less credit do I deserve ; and my blue blood only brings with it bigger responsibilities. Being born of a particular set of noble parents, I must utilise the facilities, that my body and my environment (which perhaps affects me more) giv

me, to help other men who are not equally fortunate. If I do succeed in making their burden a little lighter, they might, in their turn, show their appreciation of it. It will show that even with inferior bodies they are capable of expressing gratitude; but that is their affair. If the Englishman considers himself superior to us, in some respects—as he undoubtedly is—it adds to his responsibilities. But it is not for a Britisher to expound the great things that he has done in India. That is Shâstri's business. He has done it before and will do it again. But racial pride has caught hold of us so firmly that the best of us—even Irwins-find it difficult not to talk of the glorious deeds of their race. This sort of thing has done immense harm in the past and that is why in trying to study man, it is necessary at the very outset to understand that the rise and the growth of different races of mankind is a very interesting subject well worthy of our attention, but instead of teaching us to be proud of our instrument, it ought to direct our attention to the musician within.

172. Symmetry of form—a great fact.

In addition to the racial characteristics, another thing which strikes us in our look at a man is the symmetry of his form. This is a great feature of all animal life and yet we do not sufficiently appreciate this great fact. We are so accustomed to see two hands, two feet and two ears, that we are apt to see nothing wonderful in it. "Nature abhors a vacuum" is no longer a

sufficient explanation ; but we seem to be content to accept a dictum that "Nature likes symmetry; and also understands a bit of geometry." We know how difficult it is to draw a simple geometrical figure symmetrical about one axis, without the aid of special instruments; and yet wherever we look, we see nature giving us a multitude of mirror-images of solid objects. How does She manage this miracle?

173. Explained by rotation—fourth dimension.

If we think about it, we shall see that duplication or mirror images of plane figures are very difficult, so long as we confine ourselves to that plane only; and in all our instruments for drawing symmetrical figures, we have to have recourse to a third dimension. Thus with a compass we take an axis at right angles to the plane and make a point rotate about it to get a circle. If we take any plane figure and rotate it round any axis, lying in that plane through 180°, we get its mirror-image. Diagram (II) shows a plane signature and the effect of doubling the paper, while the ink is wet. All the beautiful symmetrical figures were obtained by folding the paper and the reader can amuse himself for quite a time by preparing similar designs. A symmetrical figure on a plane surface (having only two dimensions, length and breadth) is very easy for a person who is able to work in three dimensions. All he has to do is to rotate the figure in the third dimension. Why should we have only three dimensions in nature and not four, is a question

difficult to settle ; but if we assume for a moment that we have Beings who are conscious of and can work in four dimensions, it would be mere child's play for them to turn our right hand into the left hand by rotating it round a plane. They will only be doing in substance what a mirror does in appearance. May it not be that all the three dimensional symmetry that is so universally characteristic of animal organisms is only the result of such a rotation and hence an evidence of the physical existence of a four dimensional world? This is rather a difficult subject to grasp, but is very interesting all the same, and we shall again revert to it later ; but we might note here that it supplies us with a logical explanation of a universal phenomenon ; and it does not seem absurd to investigate it further.

174. Man only water and charcoal.

The chemist will tell you that a man, like everything else in nature, is a bundle of atoms. Whether he is a mere beggar in the street or a Grand Commander of the Star of India, he is composed of 60 per cent. of water, so much carbon or charcoal, and nitrogen, with a few ounces of sulphur, phosphorus and iron thrown in. And yet, if you give the chemist respective quantities of these elements, by no process can he convert them into anything but a fortuitous concourse of atoms. He cannot make of them even an amœba or a flea, far less a man. Living beings no doubt consist of so much carbon and hydrogen, but these elements are built in them into such a complex structure that it defies all imitation. Thus a

molecule of Hæmoglobin from the blood of a horse is made up of C_{712} H_{1130} N_{214} S_2 FeO_{245} a total of 2304 atoms making up a molecule which contains one atom of iron and one only, and this one atom is as essential as the keystone of an arch. Take away that one unit and the whole structure will fly to pieces. Obviously there is some design in the making up of even a molecule; and it is hardly logical to call it a fortuitous concourse.

175. Not even these our peculiar property.

Another curious thing about life is that although a living being consists of so many elements, none of them are, so to say, in its sole possession. The carbon particles which are running through my blood at this moment will soon be floating in the air, and their place will be taken up by others. The same nitrogen molecules that make up a blade of grass get into a cow a few minutes later. Next day they enter the milk and will be found in Mr. Jones the day after, where they may stay for some time, or go out to a manure heap, to become that beautiful blade of grass again. All matter circulates like that, and at no time can a set of molecules be looked upon as the peculiar property of one man. That bundle of matter, which a man or a woman admires in a mirror every day is not his or her own. He or she, in fact every living creature, is a mere mould in which fresh particles of matter come in every moment, where they play about a bit by forming new combinations, and pass on. It is only the frame-work that persists, as it does

in an institution like a School or a College, where students enter at one end and pass out at the other, where the entire staff may be changed in a few years' time, and where the very buildings may be pulled down and rebuilt on another site. And yet, the school remains the same. Similarly the Karachi or Bombay of 1931 is by no means the same that it was fifty years ago. Possibly none of the people who lived in these cities then are now alive. Streets and buildings have changed beyond recognition and still Karachi or Bombay exists same as you and I. That is an essential characteristic of life.

176. Who chains them together ?

What keeps all these particles together, and why so only until that particular moment called death, from which instant all molecules begin to fly off at a tangent and dust returns unto dust? What is the nature of life that breathes on this dust and makes it alive? We frankly do not know, and yet it is a fact, which ought to make us pause, one on which we may ponder a bit, instead of laughing it away. When a man dies, there is at least no visible tie that is broken asunder ; but there is no doubt, that something which holds these particles together during life seems to snap at death. What can it be ? Here again it is interesting to revert to our conception of the possibility of a fourth dimension. We have all seen Myer's magnetic needles, which freely floating

on water arrange themselves into perfectly regular geometrical shapes, if a powerful magnet is held above them. If the magnet is shifted to a distance the needles all fly away. The magnet never was visible in the two dimensional world in which the needles float, and its movement can only be inferred by the confusion in which the needles seem to fall. In the absence of any better explanation, is it foolish to assume for a moment that perhaps it is something like a magnet acting in a dimension higher than our solid world, that holds all these elements together ? And if that magnet is the real cause of all the phenomena in this world, the cause will naturally survive death, although it may cease to show any effect in this three-dimensioned world of ours. This is of course a speculation, but well worthy of a moment's thought.

177. Animal life depends upon vegetation.

We have seen how the particles of matter are the common property not only of all animals, but vegetable life as well ; and it is interesting to notice how their activities and needs are complementary. Thus carbon is an element perfectly insoluble in water, acids, or alkalies, and so no animal can take it in that form. But it readily combines with oxygen and forms CO_2 a gas, which again animals can make no use of and which in fact acts as a poison to them. Here comes in the vegetable world, in which the green scum in the leaves has the power of decomposing

this CO_2 into oxygen and carbon in the presence of Sunlight. It is only in this manner that plants succeed in catching carbon and once thus entangled in the meshes of life, it is passed on to the animals, in a form in which they can make use of it. But this carbon is only lent to the animal kingdom, and has to be returned to the plants. That is done through the agency of another red scum, which carries back the bereaved oxygen to the carbon in our body. The carbon meets its long lost spouse and CO_2 is again formed and thrown out into the air, to float merrily until required by plants again. Thus plants and animals keep the cycle going not only in the case of carbon, but of nitrogen and other elements as well. Does this look like a mere fortuitous concourse or an ordered whole, where all matter is the common property of all life, animal and vegetable? And if our very flesh is not really our own property, what justification can we have for considering oūrselves superior to others? Every form of life, every creature, every man is essentially the equal of another and ought to be treated as such. If the very particles of which I am composed were yesterday the property of another individual, and will pass on to some one else tomorrow, all snobbery whether based on race, caste, colour, sex or religion would appear to be only foolish.

XVIII. A MACHINE THAT GROWS.

178. Man the machine.

In our cursory look at a man in the last chapter, we saw how the colour of his skin is after all not worth much. Race differences do exist, but they cannot wholly determine the nature of the Inner man. They can only help or hinder. In fact they confer no privileges, but impose responsibilities. Blue blood demands better behaviour. We noticed the symmetry of form in man and all other animals; and I tried to show how the physical existence of a fourth dimension would make this easy. From a chemical point of view man is but a bundle of charcoal and water, together with a few other substances thrown in; and Life only holds them together in a pattern where matter flows in at one end, and goes out at the other. How does IT manage that? Then again, even the carbon and nitrogen inside a man are not his peculiar possession. All matter is the common property of all life, and all individuals are essentially one, and equal. These are the things we learnt by looking at man—the machine, as a whole; and we shall now try to study the structure of his body.

179. Animals live, grow and move.

In nature we recognise three kingdoms—mineral, vegetable, and animal. Crystals from minerals grow, vegetables live and grow, animals

live, grow, and move. The manner in which growth takes place in each case, and how life affects it, we shall consider later; but before we do that, it is advisable to form an idea of the general frame-work of man's body. Both plants and animals have to withstand the onslaught of natural forces—wind, rain, heat etc., but the former do not shift their position. They can therefore anchor themselves firmly in one place, and arrange all their affairs from that point of view. They are like a steam engine, fixed on solid foundations in a mill, whereas animals are like locomotives which go from place to place and have to be self-contained. Plants therefore have a set of roots, which go into the ground, and a trunk which shoots up into the air, with foliage on top, all built to resist any attempts to dislodge them. Plants do not eat but take their nourishment only in a liquid form, for which purpose they have a thousand mouths in their root tips, with which they grope about in the bowels of the earth. They breathe through a thousand noses, in their leaves. As an animal can quickly move from place to place, only one mouth and one nose serve his purpose. But the whole structure of his body has to be altered to enable him to do so.

180. Struts and ties.

We have all seen how a tent rears up its head, with a stiff pole in the centre, and thin flexible ropes on all sides. That is how our bodies, in fact all structures in nature, are builded with one

set of rigid members, which can stand a lot of pushing without being crushed and another set of fibres which, soft as they are, will allow themselves to be pulled a great deal before they snap. These two, called struts and ties in engineering parlance, have quite different and seemingly opposite functions; but one cannot act without the other. Like the hard, unbending man and the loving, accommodating woman, they make up mutual deficiencies, and keep together the whole family. That is not a question of sex but of gender, and sometimes it is the wife's turn, to be the real prop of the family. In such cases in the Sanskrit language she is called "Dârâ"—still meaning a wife—but declined in the masculine gender. It is interesting to note that a real womanly wife is considered feminine, as she should be, while a sixth or seventh wife, who is neither here nor there, is called "Kalatra," and declined in the neuter gender. We do have such neutral objects and people in nature, but they do not count in any structure. Our bodies are thus formed with a number of hard, stiff bones, kept together by thin flexible ropes called muscles.

181.The bony skeleton.

There are 238 such bones in a man's body, kept togther by 1400 sets of muscles. The bones are of various shapes and sizes., perfectly fitted together, and a glance at Diagram III, will show how wonderfuly they are suited to the duties required of them. Notice the arch in the

step which together with the muscles tying it up, serves as an elastic spring to absorb shocks, inevitable in walking. Had it not been for the two bones in the lower leg or the forearm, we would find it very difficult to turn them round. The hard knee-cap shields the joint from possible injury. The bent upper head of the thigh-bone, in which every fibre has been given the shape, thickness and position which ensures the greatest strength with the greatest oconomy of material, is a marvel of engineering skill. The ball-and-socket joint enables us to move our legs and arms quite freely without interfering with transmission of the load. The hip-bones form a wide pan, to support the intestines, and in the case of women, the womb as well. The backbone, made up of a number of perforated bony discs, gives us a flexible and perfectly protected conduit for our telegraph cables, which we shall speak of later. The open basket work of the ribs allows of the free expansion and contraction of our lungs. The topmost two discs in the backbone are shaped like cymbals, to permit of movement both sideways and up and down; and yet these are so pierced that our telegraph wires can pass through them undisturbed. The uppermost of these discs is called the Atlas on whose shoulders is delicately balanced the hard jewel box, in which our brain, the most valuable of our possessions, is kept. Last, if not the least, would come our jaws—the grinding mill, which enables us to pound up our food. All these form the bony scaffolding of our house or the temple

as some choose to call it, in which the Inner man lives.

182. Our wonderful engines.

Fourteen hundred muscles not only bind together all these bones, but they are the engines which move them. A muscle-fibre is so thin that 500 of these have to be put side by side to make up one inch, but it may be an inch or more in length. They all lie together in bundles which are enclosed in transparent sheaths and act as one. Each muscle fibre is made up of dark-looking discs separated from each other by clear spaces, like a pile of copper and silver coins placed alternately. These discs are charged with a fuel called glycogen derived from blood, and to each is joined the end of a nerve. When an impulse arrives along this nerve, the glycogen seems to explode into lactic acid. The discs become thinner and wider, and the muscle contracts. The chemical change sets free energy which can be turned into work, and thus we can lift weights. The whole action is like that of a motor car engine, fired by the electric spark with the one difference that lactic acid which is the waste product is not thrown out at once. Five-sixth of it is slowly reconverted into the fuel glycogen—a feat which no motor engineer has yet been able to perform. At a time, only one-sixth of the fuel gets burnt up and this supplies the heat required by the body. The usual products of combustion—water and carbon-dioxide are carried away by the blood. These little discs thus act like engine cylinders. In a well-developed biceps

of a working man there are 600,000 of these ; and yet all these respond to a stimulus instantāneously. The 1400 muscles with their myriads of microscopic cylinders, firing at appropriāte moments, not only hold together the bony skeleton, but move it from place to place and also enable men to do mechanical work. Their mutual movements have to be so delicately timed and balanced that it is not surprising that a child takes a little time to learn to walk. Our bones and muscles are certainly not a fortuitous concourse.

183. A perfect lubricating system.

Every movement naturally involves rubbing of one bone against another and that means friction. Total removal of friction is impossible, but the problem of minimising it has taxed the ingenuity of designers of all kinds of machinery. The only way known is to interpose a thin film of oil between the two rubbing surfaces. But the difficulty is to keep that layer of oil in its place. The pressure between the moving parts tends to squeeze this out ; and this tendency is the most pronounced where the pressure is greatest, that is, where lubrication is required most. The oil, moreover, decomposes owing to the heat produced at the joint. The only way of achieving this end is to force a fresh quantity of oil in each bearing every few minutes, or to let all the moving parts move in an oil bath and trust to chance to change the film between the rubbing surfaces. That is the best that man has been able to do. Let us see how man's Maker has solved the problem of

lubricating 230 joints in the human body. Here the two rubbing surfaces are covered with a thin layer of a tough and smooth substance called cartilage, which is elastic and serves as a buffer. When the two cartilages rub against each other the cells on the surface get loose, and become soft and slippery—and provide the necessary oil-film. All joints are completely enclosed by flaccid membranes, and there is no wastage of oil. The greater the rubbing the more copious the oil supply, as it should be ; and yet no drain pipe is necessary to carry away the excess oil, as this is reabsorbed and returned to the blood. Thus are we provided with a perfect system of lubrication which is entirely self-adjusting, and economical. When it breaks down, as it sometimes does in old age, we get rheumatism ; and the joints seize. But that happens only when we disregard other laws of health.

184. The machine that grows.

Another great feature of the human machine is that unlike man-made machines, it grows in size. Beginning with two microscopic cells from the body of the mother and father, which fuse into one, it grows into a complicated machine weighing a hundred pounds in twenty years' time. During the first nine months, the one cell multiplies a thousandfold, and differentiates into the bones, muscles, nerves, skin, hair, nails, etc. each in its appropriate place. How, all this great variety of structure is built out of one blood-stream from the mother, is a marvel in itself, but at any rate, this

growth takes place in a sheltered place, in the comparitive seclusion of the womb. But after birth, it still grows tenfold, while performing its duties in the world. Have we ever heard of a two-seater motor car growing into a five-seater as the owner's family increases, or of a doll's house expanding to a full-sized cottage, because the girl who played the mother has become a real mother with dolls of flesh and blood?

185. The cottage which expands into a palace.

And yet that is what is happening to every human body—the wonderful house in which we all live. While we eat and sleep in it, the very walls increase in height, and the roof expands. the beams get larger, and thicker, and the whole room grows bigger. To take just one example, the thigh-bone in a child is about 4 inches in length at birth. Only the shaft is made up of bone, formed not as a solid but as a hollow pillar, the ends being soft cartilage. The soft tissue is gradually replaced by hard bone. Fresh layers are added on the upper surface of the neck while material is cut away from its lower surface; and so the bone increases proportionately in all places. The muscles connecting it with other bones as well as the blood vessels, nerves etc: have all to keep pace—a fact which our budding Sandows might keep in mind. Muscles cannot grow without adequate blood supply. Given that, the whole thigh grows to four times its size in 20 years. It is estimated that about two million bone-builders are engaged in the construction of that

one thigh-bone of a newly born child and by the time their task is completed, an army of one hundred and fifty millions is employed on the job. Nor is this army demobilised when the work is over ; it is maintained as a standing army to look after the works and to effect repairs, in case the bone should get broken. That is one bone, and there are 238 of these, not to speak of other tissues equally important. Thus does our cottage expand into a palace, while we are in occupation all the time. We do not need " Road closed " boards.

186. Living things grow from within.

This growth in the bodies of living creatures, moreover, takes place not by addition from outside, but multiplication from within. A crystal grows by accretion, a wall is raised by heaping up more bricks ; but in our bodies, each brick somehow expands into two bricks. It is not merely a question of imbibing watery nourishment by osmosis. Cells do not divide like the frog who wanted to imitate a bullock. That would only result in the bursting of a cell wall. Every cell-division is presaged by a splitting up of its centrosome, round which the chromsomes rearrange themselves, and the two new cells are an exact replica of the original cell. The "urge to divide" that overtakes a cell is something quite different from the pumping of a football. It is certainly not the result of liquid or gaseous pressure. Ten millions of living cells can be accommodated on the surface of a coin ; and yet a single one of these has in it the potentiality of life, and when

the inner "urge" comes on it, it can blossom into a Bunyan, a Baboon, or a Birkenhead. This "urge" is no doubt akin to pressure, but it is not one that originates in three dimensional space. Life is essentially a phenomenon of four-dimensional space, and it is only when we accept this simple fact that we shall understand this "sex urge", this "will to multiply". We have already seen how it is not unreasonable to assume that a force from the fourth dimension keeps together our bodies, like the magnet round which Myer's needles group themselves; and if a small piece were to break away from this magnet, should it surprise us if it carries away with it a few of the needles, and starts a system of its own? Does not the division of the centrosome, which is but the focus through which the vital currents flow in, point to this conclusion? Living things thus grow from within, and so does the house in which all human beings live and move about.

XIX. RUNNING THE MACHINE.
or
A HUGE CITY.

187. Our body a huge city.

The human body is a complicated machine. It grows, as we have just seen, and building materials have to be supplied for the purpose and transported to all parts of the body. It does mechanical work which means expenditure of energy, which has to be made good. Like all machines its parts are subject to wear and tear, and this has to be replaced. We likened our machine to a house, but if we consider the enormous variety of structures within the body, and the fabulous number of inhabitants that live in it, we shall see that a city would be a more appropriate name. Our body has been so described by many poets of old, and it is a very good simile if we do not carry it too far. The business carried on in a modern town can give us a very good idea of the problems that confront our Maker, in designing our bodies—nay even those of the tiny ants. It is interesting to see how He has solved them.

188. The oxygen market.

This wonderful city of ours is surrounded by a wall on all sides having only one ivory gate, through which solids and liquids can go in, with a

wicket-gate by the side, for gaseous visitors. There is no other entrance, and even when we get completely drenched by rain, not a drop of water can get in except through the mouth or the nose. Both these passages are well-guarded. Even solids and liquids give off gases and these go in advance through the wicket-gate. Their credentials are there examined by Mr. Smell and if found unwelcome, they are either thrown out or killed, and orders are issued to the doorkeeper not to admit the main party. Not a particle of air is allowed to go in without being carefully searched in the winding passages in the nose. All dust is kept out. If the air is too cold, it is warmed, and if too dry, it is moistened. Any disease germs trying to smuggle through are killed on the spot by a disinfectant, which is specially manufactured in a factory nearby. And so when we are in good health only wholesome gases are allowed to go in through the nose. This arrangement for dealing with gaseous intruders does not exist in the mouth, which is meant for solids and liquids only, and hence the great value of breathing through the nose. The air that is thus admitted goes into the lungs which are a great market, where a large amount of oxygen required in the city is purchased. The oxygen is there packed in millions of flat, circular coin-like boxes, which are then coloured bright red. These boxes, and there are 4 millions of them in a drop of blood, are dumped into the blood-stream, which circulates round the whole body. The oxygen has naturally to be paid

for by exchange of an equal quantity of carbon-dioxide, which is then thrown out of the body for the use of plants, as we have seen before. In this market, as in ours, a number of people come in just to see the fun and these form a large majority. Practically all the business done is in oxygen of which we absorb 16 cubic feet or a large boxful every day. To get the carbon dioxide which we throw out during that period, we would need to burn eight ounces of charcoal. A few other gases do get in, but their quantities are negligible. And so our lungs can properly be called the oxygen market.

189. The gate-keeper of our city and his daughter.

In our body there are no arrangements for transport of solids except in a pulpy semi-liquid condition; and so, as soon as any solids enter the ivory gate, they are caught hold of by the gate keeper, and pushed under a set of choppers and crushers. On their head is poured a liquid prepared in numerous adjacent factories, to which a message had already been sent by the advance guards from the nose. This fluid not only helps to get the solids into a condition in which they can be pushed along, but induces chemical changes as well. It converts the starch into sugar, and that is why dry bread if properly chewed and mixed with saliva tastes sweet. The gate keeper not only pushes the visitor hither and thither but at the same time his daughter Miss Taste examines them to make sure that they will not do any harm to the body if they are allowed to go in. Generally

she does her work fairly well, and persons, not approved of by her, are at once thrown out of the gate. But after all, like other young girls, she has her own likes and dislikes and she sometimes smuggles in her own friends, who might prove troublesome inside the city. In such cases, under instructions from a higher authority, she is compelled to admit and even to make friends with persons like Miss Castor oil and Mr. Quinine for whom she has a positive aversion. If only this gate-keeper and his daughter were properly trained, a great deal of misery in the world could be avoided.

190. A broad-way for the immigrants.

The gateway opens on to a broad thoroughfare passing right through the city. This is meant more for immigrants than for stray tourists. There are instances of idle spectators like iron-screws going right through, but generally admission is on business only. That is why all visitors are thus examined. tasted and only such as are likely to prove useful citizens are allowed to come in. One quality demanded of them is that they should be willing to cooperate with others for common good, and we have just seen how they are rather roughly handled at the gate to make sure of this. Only the tractable who are willing to mix with Saliva are carried along the road which is over twentyfive feet in length and winds round and round through the city. With the exception of the short passage leading to the oxygen market, our city has only one such road.

All traffic along this is in one direction only, except when it is easier to eject a nasty intruder through the entrance. The avenue is lined on both sides by many factories, which dump their products at intervals and by markets where a great deal of business is done. Every variety of inducement is offered to the visitors, by alkalies, acids and the like, and they are encouraged to settle down in the city. As in London streets, loitering is not permitted, and every one has to "move on."

191. The garden party in the park.

After the food passes the gate, it has to jump across the air avenue, which is temporarily closed by a flap. No solids and liquids are allowed on that avenue, and every particle trying to get in is summarily ejected after spluttering and coughing. Once the immigrants pass that crossing they are led along a broad straight length up to the second portal, which readily opens to admit visitors to the stomach. This is like a huge park where at a garden-party all the new-comers get an opportunity of intimately mixing with each other, and with the house-party. We have already seen how the maidens from the Ptylin tribe, with their alkaline blue saris, accompanied them from the first gate; and they are now joined by damsels from the Pepsin family with their acid-red robes, who pour in large numbers from their adjoining chambers. The acid robes are manufactured in adjacent factories from common salt, at the temperature of the body—a feat which no human chemist has

yet succeeded in performing. Thus clothed the Pepsin girls are irresistible, and many Proteins succomb to their charms, and all these married couples pass out by side streets to look out for a house. Alcohol is another pushing gentleman who enters our city in like manner; but a great majority of the immigrants naturally hesitate and all these, after a reasonable stay in the stomach, are gently but firmly led along through the third portal. Once they pass this third gate they are not allowed to return under any circumstances, and must pass on through the winding labyrinth to the only exitt at the other end.

192. The narrow winding road.

As they pass along this narrow road they are further joined by Trypsin lasses, who are the cousins of the Pepsin family, but with blue blouses and they carry the proteins by storm. There are also some relations of the Ptylins who sweeten the life of the starches; and then there are wenches from a family who like to marry fat people. So what with one attraction or another, provided in the park or the billious atmosphere of the narrow streets, most of the immigrants take the plunge, and decide to settle down, when they are taken to the citizen's schools, and thence to the employment bureau. Unless there is something wrong with the Pepsin, Trypsin and other families who act as hosts, very few guests leave our city. Even these are led on to a large waiting hall, where another attempt is made to induce them to stay. Only then, are they allowed to go out

through the fourth door, along with the sweepings from the long road. Thus is immigration into our city controlled, by a very efficient department.

193. Underground for citizens.

In addition to this road for strangers, we have in our city a perfect water-carriage system, meant only for citizens. It enables them to get round the city very quickly, as in tube railways; only much more efficiently. If the London Underground can run thirty trains an hour, we have a continuous service by which a citizen can travel round the whole city thirty times during the same period. The stream is maintained by a powerful pump equipped with uptodate valves, which pushes the blood along elastic pressure pipes. These are also provided with flaps which open only in one direction, so that there is only a one-way traffic. The service reaches the extreme ends of the city, and pierces the narrowest labyrinths. It carries not only the citizens, but merchandise as well, of which the most important are the oxygen boxes. This vital gas is carried to parts wherever it is required, and the empty cases are brought back along another road to a second pump, which sends them to the oxygen market for refilling. From the market they come back to the first pump, to go the round again. On the way the stream passes through the kidneys, where all nitrogenous waste is removed.

194. Police and postal arrangements.

The blood stream not only carries with it everything that is likely to be required in the remotest

corners of the city, but it provides perfect police and postal arrangements as well. Not the least curious are the set of workmen of Fibrin family who have orders to close breaches in the stream. They wander all over the body for days and days, with nothing to do, but perfectly vigilant. Make the smallest puncture in the city walls and they at once put up the "road closed" boards, spread their fibrous nets, in which thousands of oxygen boxes get entagled, and thus stop the breach. (Diagram IV.) In the meantime a message has already gone to the police station, and hundreds of white cells (of which we have 7000 in a drop of blood), our policemen—rush to the spot to fight any intruders that might try to get into the closed city through the breach. We can help in this by covering the wound at once with an antiseptic screen through which unwelcome people cannot get in, but once they go in they have to be dealt with by the local police only. Often the battle wages furious. The police are unable to cope with the intruders. Traffic has to be speeded up and the pump beats faster, giving the peculiar throbbing sensation we all associate with bad wounds. There is a feverish haste all over. Millions of policemen die in the war forming the yellow pus, but their place is taken by others. In the meantime, masons work under cover, and at last the breach is closed. Unlike our cities, in our body policemen are born, not recruited indiscriminately, and so to police stations are attached huge maternity homes and training schools; and there are a number of white corpuscles

there ready for emergency. In times of war, their birth rate also rapidly increases. No less wonderful is the postal organization. Orders are posted from the Thyroid which regulate the activity of the bone-building masons. The hair on man's upper lip will not grow until orders are received from the sex apparatus, nor will the milk factories in women open business until they hear from the womb that a child is expected. Such orders are not worth telegraphing. They are sent by post packed up in boxes labelled "Harmones."

195. A wonderful city.

Thus is the machine, our city run. All that we need is taken from outside, assimilated and supplied to the various parts of the body as required. Every arrangement is made to keep out unwholesome things and if any injurious substances get in, they are at once sent out. The air is cleaned, warmed, moistened and disinfected before it is allowed to enter. Food—solid and liquid—is tasted, pounded into pulp, mixed now with alkalies, now with acids and ferments, and all we need is extracted out of it. The Blood stream takes all the substances to the remotest corners, and brings back all the refuse. Whatever of this can be repurified is so dealt with, so that wastage is kept down to a minimum. The body-fluids are preserved intact and unpolluted, all germs which enter it being killed, and eaten up by the white cells. As soon as the main tubes are ready the Life current is started from the mother's heart, long before the

child is born and while its own pumping station is being built. The child's heart then takes up the work from birth, and carries it on faithfully and unceasingly unto death. And all this wonderful machinery springs up from the union of two tiny cells, towards which all matter seems to rush in, and from which the city is built atom by atom. It is certainly a concourse, but to call it fortuitous does not appear very rational. It cannot be explained by calling it a mere chemical phenomenon. It certainly is all that, and something much more.

XX. OUR TELEPHONE SYSTEM.

196. Man—the ruler of the city.

We have been studying a typical man, and we have seen how wonderfully he is built. His body is like a huge city, or as it moves, like a modern liner, which is peopled by a very great variety of citizen-cells, who carry on their different avocations, each in his own way. New cells are born, they eat and do their appointed jobs. They multiply and die, their remains being made use of elsewhere in the city or thrown out. Some of them do not live more than a couple of months; but Man, the sum total of their activities, lives on for years. It seems very doubtful whether the tiny cells are at all aware of the existence of our Man, and yet a Man ceases to function as soon as the orderly life of the cells gets deranged. That is one way of looking at it, but is it not equally possible that the real Man acting from a world of his own like the magnet in Myer's needles, starts a city of cells of his own, for his own purpose? He keeps it together as long as he needs it, but, more often than not, the citizens get into bad habits. They cease to do their work properly. Undesirable immigrants are admitted. Instead of cooperating with each other, some parts get swollen at the expense of others, leading to congestion of traffic, and the whole city gets into such a mess that the Man in utter dispair takes away his controlling hand. There is anarchy.

The city is invaded by the ever-present gangs of Vandals whose business is to pull down deserted cities and who attack it with vigour. Dust returneth unto dust. The Real Man goes along his own way, perchance to try again.

197. Our city—one amongst many.

While man is here, he is only one amongst many; and he certainly does not come down only to eat. He has to do so to keep up his body, but he eats to live amongst his peers, to hold intercourse with them. Each man sends out vibrations which are picked up by others, and thus they communicate with each other their ideas, and desires, and then meet them if possible. We have at the outset to realise one great fact that individuals know nothing of each other, except through vibrations received. This means that all our knowledge depends upon the transmitting apparatus, the medium and the receiver, and is affected by all these three. The inter-position of a thin red or green glass in the medium will make the whole world look red or green; and this ought to teach us not to be too sure of our own impressions. All our vibrations are three dimensional phenomena and we can understand them rightly only by rising into space of a higher dimension. All talk of correctly interpreting phenomena without that vision is futile. But while we are limited to three dimensions, we can ofcourse make the best of it. We cannot order the medium which brings us the vibrations, nor can we adjust the transmitters of other people; but we can at least put our own

receivers in better working order. For this we must first study how they work.

198. The citie's five wireless receivers.

At the present stage of evolution every man is fitted with five such receivers. Our ears respond to vibrations in the air and through them we "hear" what other individuals say. The skin comes in direct contact with other substances and the numerous look-out citizens report to the King, what they feel to the "touch." Our eyes take in waves in the luminiferous ether, and enable us to "see" things. The tongue is affected by liquids placed in the mouth, which we "taste"; and our nose when bombarded by different gases, or fine particles, tells us how they "smell." All these five receivers are equipped with necessary telephone wires, which carry their messages to the Inner man; and during our waking life, most of the telephones are ringing all the time. How the Man can attend to five telephones or loud-speakers shouting at him all together, and make any sense out of that jumble, passes comprehension; but he performs that feat every moment. Under such conditions mistakes are not unusual, nor need we be surprised at them. On the whole, the arrangement works quite well, and that itself is a marvel.

199. Their peculiarities.

Two of our receivers—the ears and the eyes—are affected by vibrations coming from a distance; but the nature of these is quite different. The

ear takes in "sound" waves, which travel only 1100 feet while light waves rush in at a rate of two hundred thousand miles per second. That is why we see the steam issuing from the whistle of a distant engine, long before we hear the squeal, and the lightning flash blinds us before the thunder crashes into our ears. The eye can see only objects coming within a cone of about 45 degrees in front of us; and if we do not want to be bothered by unwelcome sight, we can shut off the reciever by closing our eye-lids. The ears are affected by sound waves coming from all directions, and that is why the approach of a motor-car can best be conveyed by a "honk". Our three remaining receivers do not respond to vibrations, but have to come in contact with the objects themselves. The gases generated in the kitchen, or the vapours given off by the rapidly vanishing lavender or even solid particles floating from the musk have to enter our nose before we can smell. Our food has to be placed in the mouth in a soluble from, before we can taste it; and we have to get hold of things or bump against them before we can tell whether they are soft or hard to the touch. That is what every child is trying to do, when it attempts to catch the moon or puts a shoe into its mouth. It is learning to use its receivers.

200. Man "sees" with his eyes.

Of these receivers, the eye—the one that responds to light waves—brings us messages fromthe farthest corners of the Universe. Although light travels

so fast it takes eight minutes to reach the Sun, and the light that arrives here to-day from some of the stars beyond, left them two thousand years ago. Our earth large as it appears to us is but a tiny globe, and light from objects on the earth reaches us practically instantaneously. Light travels in a straight line from the source and is reflected, refracted or dispersed. But it is only when it enters the eye, that we notice the object from which it comes or appears to do so. The eyes are placed in sockets in the bony skull well-protected from possible injury, by the projecting roof on top. The eye-brows and eye-lashes further help in keeping out all water and dirt from entering the eye. The light enters the eye through a glazed window which is often washed by a saline solution, specially manufactured in tear glands. The window is covered with a soft moist lid, which wipes it clean every few seconds and closes it when necessary. There is another circular curtain inside which opens out to admit more light in a dark place, and reduces the opening to avoid glare in brilliant sunshine. A lens of pure crystal then collects together the rays and throws an image on a screen behind. Unlike lenses made by man the lens in our eyes is elastic, and can be made flat by pulling at the sides, thus altering its focal length and enabling us to see objects at different distances. The clearness with which we can do so depends upon the elasticity of the lens and the strength of the muscles which work it. Like other muscles, the muscles attached to the lens can be developed gradually, and if a little attention

were paid to this aspect so many of our young men would not feel blind without their glasses.

201. Man's wonderful cinema camera.

The image is focussed by the lens, on the screen which is not an ordinary ground-glass, but a sensitised film. It would be more appropriate to describe it as a layer of photo-cells filled with a chemical which is affected by the light, and what is more, differently by different colours. The chemical is constantly and continuously renewed seven times a second. So that, if impressions succeed each other quicker than that, the eye cannot distinguish between them, and we feel as if the picture is moving, a fact made use of in the cinema. Thus with our wonderful cinema camera we are taking 500 pictures in perfect natural colours every hour. What chemical is used, how it is manufactured out of the bread and butter that we eat, what happens to it when light impinges upon it, and how it is renewed thousands of times every day are all matters of which we as yet know very little ; but it does not seem unreasonable to suggest that we should try to conserve that chemical as far as possible. We would laugh at a man who was constantly taking cinema pictures aimlessly only to destroy them, and yet that is what we are doing for a great deal of time. The eye is meant to to enable us to see things clearly, and when we need it we must use it; but Dr. Bates of America *has pointed out that if we only keep this

*The cure of Imperfect sight by Treatment without glasses by Dr. W. H. Bates. (Central Fixation Publishing Co., New York.)

fact in mind, and give our eyes a little relaxation and rest, whenever we do not really need to use them, our eyes will give us much better service.

202. The pictures have to be interpreted.

A number of thin cables convey the picture from the screen to the brain, where the Inner man has to interpret it and it is interesting to notice how he does it. The image on the retina is always inverted and yet we see the world in the proper way, because we feel it must be so. Light rays travel in straight lines, and so when we look at ourselves in a mirror for a moment we feel as if we stood inside it. When the moon rises it appears quite big by comparison with the dark objects on the horizon. It gets smaller and smaller as it rises. We rush in a railway train and our eyes seem to tell us that the trees are all running past us. When the earth rotates, it is the starry heavens that go round us. Two straight lines of exactly the same length with ends tured in or out appear to be of different lengths. A line drawn slanting across a number of parallel lines appears crooked—Diagram (V). As parallel lines look curved, they have to be drawn curved, (as any one can verify on the face of the King in a ten rupee note,) in order to make them look parallel. That is not the fault of the eye. As an optical instrument, it is a very good instrument, and yet the Inner man finds it so difficult to interpret its report. This should teach us to be a little cautious in making assertions. Our impressions

are no doubt the only thing we can go by, but then the other fellow may have his impressions as well. At best the eye is but an instrument—a telephone, with which the Inner Man can get into touch with other objects in the world.

203. Man "hears" with his ears.

Man's second wireless receiver is his ear. The rapidly vibrating reed in the horn of the approaching motor car, sets up alternate waves of condensation or rarefaction, which travel ahead of the car and enter our ear. The funnel-shaped outer ear helps to collect them together. It naturally acts better on the waves that come directly into it, and thus enables us to ascertain the direction from which the sound comes. The two ears placed on both sides of the head save us from having to turn it right round. Hunted animals living in thick jungles, are provided with larger funnels. Unlike man, they can moreover move these funnels sideways without moving their eyes from the direction from which they expect danger. All these contrivances are necessary for them as their very existence depends upon their hearing very faint sounds. But man lives in a much noisier world and long ears would be a disadvantage to him, expect for the night-watchman, or when hearing an interesting lecture. And so in his case, the funnels are reduced to a minimum size and the ear becomes a general-purpose receiver responding to sounds from different directions almost equally.

204. The drums and piano inside the ear.

The vibrations set up by the motor-horn and collected together by the outer ear enter the inner ear through a short passage where a tuft of hair deters insects from entering, and the wax secreted by the walls serves to attach particles of dust. The waves impinge on a membrane stretched across the opening and move it backwards and forwards. Like other drums this skin can be drawn out more tightly and so made more sensitive; and that is what the night sentry does, when he strains his ear, to catch the faintest sound. This outer drum has air on both sides of it, the inside cavity communicating with a tube opening into the mouth. For a proper working of the drum this tube has to be kept quite clear, and it is not a bad practice to shut our mouth and nose and gently blow a little air into the inner cavity and out of it through this tube alternately, a few times every morning. (That was part of the Pranayama enjoined in the good old days). The pressure of both sides of the outer drum being equal, it can move freely. To this is attached another inner drum by a set of small bony bell-crānk levers. This second drum has only one-twentieth the area of the larger drum, and so it moves with greater force necessary to set up pulsations in the watery fluid on the other side of it. The fluid is enclosed in a hard conch-like shell with a tapering spiral passage, with only two elastic windows—the oval inner drum and a circular window closed by another membrane. Immersed in this fluīd is our little piano—one in each ear—with its very sensitive

and finely tuned wires capable of responding to a thousand notes. How these nerves vibrate, how they analyse the complex waves that come in, and how they convey any meaning out of them, we do not know, but they do perform this miracle. They do receive the sounds, and send them along specially laid cables to the brain, where they await the pleasure of the Inner man. If he is not attentive the sounds are nothing to him. Man can train his ears to ignore certain notes, so that if he has to live on main roads, he is not disturbed by the passing trams; or he can make his ear sensitive to the slightest change in notes, as does the musician. But afterall the ear is an instrument only—a telephone which the Inner Ruler may use as he pleases.

205. Man "smells and tastes."

Man has a third receiver in the nose and a fourth one in the tongue. They are not affected by vibrations from a distance but by the object itself. Suspended in air it has to enter the nose before we can smell it, and dissolved in water it has to come in contact with the tongue, so that we may taste it. Mr. Smell and Miss Tongue are really officers of the immigration department, as we have already seen, meant to make sure that only wholesome food is allowed to enter the system and they work together more or less. If the nose is tightly pinched, it is difficult to distinguish the taste of various objects, and many a nauseous medicine can be safely put down the throat in this manner. If the eyes are also closed

it is quite easy to confound a raddish with an apple. Like other senses Mr. Smell and Miss Tongue receive their messages, and transmit them to the brain ; but they are both so excitable that they go on shouting at the exchange a long time after the message has stopped coming in. If we sip two drinks alternately we cease to distinguish between them. The sense of smell is very strongly developed in the case of some animals ; and hunting animals can "see" their prey with their nose, from a long distance. A dog will make sure of his master by sniffing at him and a blood-hound will follow a smell for miles. Bees seem to have the best smell. Even in the case of man, a grain of musk will scent a room for years, and a very sensitive nose can smell one part of sulphur-alcohol diluted with 5 billion parts of air. Some persons have tongues that will detect one grain of of quinine in five buckets-full of water ; but in the case of a majority of mankind both senses are ruined by misuse. Just after an ice-cold drink quinine will not taste bitter, and the fumes of alcohol and tobacco will drown all other flavours. No wonder we cannot distinguish between the delicate scents of different flowers, far less be cognisant of the subtle aroma which, according to tradition, is said to accompany even invisible Beings. The Japanese are the only nation who attach any importance to the cultivation of smell and perhaps their example is worth following. At any rate, there seems to be no reason why we should neglect two out of our five receivers through

which alone we can come into contact with the outside world.

206 Man feels hot and cold.

Last but not the least comes the sense of touch. Unlike other receivers which are localised in one place, this sense is spread all over the body. Millions of telephone wires spread out like tentacles from the central exchange to all parts of the skin, so that a foreign body coming in contact with us anywhere is at once reported to the brain. The tiny receivers at the end of each wire, smaller than the tip of the finest needle, tell us whether the object is soft or hard. By moving our hands a little we can ascertain whether it is smooth or rough, and by combining the report from various stations, we can say if the surface is plain or curved. These nerve-ends are not uniformly distributed all over, each receiver serving a small district as it were, so that if we prick the skin in two places lying in one district, the sensation we get is that of touching one point only. A pair of compass-points can be distinguished by the tongue if only one-twenti-fourth of an inch apart, by the tips of the fingers if one-twelfth of an inch distant. The same points an inch apart on the forehead, or even two or three inches on the back, will give rise to only one sensation. Another set of nerve-ends tell us whether the object we are touching is hot, and yet another set which reports if it is cold. If one of these "cold" points is touched with a hot wire, the sensation produced is of cold. We do not use one thermemoter to

measure heat and another one for cold; and it appears curious that we should have in our body two sets of wires for the purpose. Yet that is what makes it possible for men to get accustomed to cold or heat, by the introduction of a little resistance into the "cold" or "hot" circuits. Then again the sensations are comparative. If we keep one hand in ice-cold water and the other in warm water for sometime and then place both of them in tepid water, the nerves from the first will report to us that the tepid water is hot, while the second set will tell us that the selfsame water is cold. Thus here again the messages received have to be properly interpreted.

207. The net-work of cables inside us.

We have seen that all impulses from the various sense organs travel to a common centre—the brain. For this purpose the body is provided with a wonderful net-work of cables inside us. Each cable is composed of a number of fibres, having an inner core, which like the copper-wire is continuous for long distances, enclosed in an insulating covering sheath. The inner conducting axis-or Axon is extremely fine, being only 1/2000th of an inch in diameter. These fibres are laid in bundles, encased like a modern multi-cored cable. Our body being symmetrical all these cables are laid in pairs. Forty-three such bundles start from the brain and branch off in all directions ensuring thorough communication with all

parts of the body. Twelve of these pairs go to the sense organs in the head (eyes, tongue etc:) and to the muscles controlling their movements. The remaining thirty-one pairs then enter the flexible bony conduit at our back, to form the spinal chord; but in doing so they change sides just at the entrance so that the head can be turned in any direction without throwing any strain on the cable. The result however is that a blow on the right lobe of our brain paralyses the left side of the body and *vice versa*. Five large pairs of nerves proceed to the arms and nineteen small pairs branch off at intervals through special windows in the back-bone, from the spinal chord to the various parts of the trunk. At the lowest end are left seven pairs which spread out in the legs. Thus is the whole body very efficiently served by a wonderfully well-protected system of nerve-cables, which would excite the envy of any modern telephone Engineer, especially when we look at the automatic exchanges, which we shall speak of later.

208. Other sources of knowledge.

These are the five principal ways in which we get to know the world round about us, more or less perfectly, and by combining the impressions we can get some more information. The impressions from our two eyes combined together give us an idea of solidity and distance. Our sense of touch, together with the report from the muscles about the power required to move an object, gives us the sense of pressure or weight. The semi-

circular canals in the ear, together with messages from the muscles in different parts of the body, give us the sense of balance. Man has moreover been able to extend the range of his senses a very great deal by studying the laws governing the transmission of the vibrations in the medium. Thus by interposing a few properly shaped pieces of glass, he can magnify the leg of a flea a thousand fold, and bring the moon within a few miles of his eye. He can "preserve" a vision by photography or painting; and he can "pickle" music in his gramophone plates; or both together in his talkie film. He has invented ways in which a sound vibration can be converted into an ether vibration, which after travelling a million times faster, can be reconverted at the other end into sound waves again, so that a man in India can actually "hear" a person speaking in London, the same moment. Improved means of communication now enable him to smell, taste and touch objects from the farthest corners of the earth. Modern science has increased the scope of his senses and this may yet expand. Whatever the additions, man's knowledge of the objects roundabout him will be confined to what his senses report. He will and can never know the things as they are, but only what they appear to be. In Kant's words he can see the phenomena, but the noumena never. The senses deal only with three dimensional matter; and if the Inner man is *always* limited by them, and has no means of transcending them, that would be quite true.

XXI. THE OPERATOR AT THE EXCHANGE

209. Man Perceives.

We have seen that the various senses send in their reports to the central exchange, where they are all compounded together into a very complex "sensation". These sensations are all taken in shorthand, and filed for future reference in our brain; and whenever any fresh sensation arrives the ever-awake record-keeper, as it were, takes out all his previous documents on the subject, and reads them aloud to us. When we visit a theatre what do we experience? Our eyes report to us the scenery on the stage, the brillancy of the light and the gestures of the various actors. The ears bring in their voice and music. If we are fully engrossed we shut off the other three receivers for the time being; but after all they are instruments and they will faithfully reproduce what they receive. The eyes cannot help reporting the large hat or pugree in front of us, and the ears will intrude on us the snoring of the neighbouring fool or the tittle-tattle of the persons behind us. Our nose may like to smell pepper-mint, or be made to smell some bad smells. The tongue will notify the taste of the chocolate we may be eating, and our telephones from the skin will remind us of the tender and precious hands we may be clasping, or of the tight bootlace or the omnivorous bugs in the chair. All the time our record-keeper will be telling us how, when we saw the same play three

months ago, the performance went off much better etc: etc: All these impressions will crowd together into the central exchange, and although we may succeed in suppressing some of them, it is their sum-total jumbled together that we "perceive."

210. Man thinks.

We have seen that the sense-impressions travel along specially laid cables—our nerves—to the brain, where each sense-organ has a lobe of its own. That they all somehow get mixed up is a fact, and this would lead us to expect some physiological fusion of the different wires into one common exchange. If such a centre did exist it might have been called the Ego or the soul, but it is curious that no such *sensorium commuune* exists in our brain. There must be some such place, but it cannot be cut up with a scalpel—it is not three-dimensional. Memory also is a fact, but memory is *not a thing.* Sensations and memory do act through the brain but they do not appear to reside there, just as electricity does not live in the switch. Both the grey matter and the copper contacts are no doubt necessary but they are not the current. A whiff of chloroform will temporarily shut off the sensations from the Man. It is this Inner man, who broods over the various perceptions, and tries to understand them in the light of his previously recorded experience. It is he who attempts to find some sequence between different impressions and thus "thinks," "reasons" and forms tentative judgments, which are filed again. It was once said that the brain secretes

thought as the liver manufactures bile. But the bile can be put into a test tube, while "thought" has eluded all attempts to catch it. Does it seem ridiculous to suggest that thought is a phenomenon with four dimensions, as perhaps electricity itself is? An honest acceptance of this possibility might help us a great deal.

211. Thought can be preserved.

Although thought will not get into a test tube, it can be, more or less correctly, preserved by the great invention of writing. How a few symbols arranged in a particular way give rise to the writer's thought, in the reader's mind is a marvel, which distinguishes man from other animals. That enables one generation to record and transmit its experience to another in a far more detailed and definite manner than the germplasm can do through instinct. This throws on man a much greater responsibility and altogether changes the laws of evolution as applied to him. But afterall language is very inadequate to express all that we feel and think, as we have all realised some time in our life. Like the gramophone plate or the photograph or the tinned food it lacks the original vitality—or vitamines, as the modern doctors say, although it admirably serves our daily purpose of life. Here again the multiplicity of languages all conveying the same "thought" is something amazing. The brain impressions must correspond to the sounds in the different languages whereas the thought as interpreted by the inner man is one, and that

is another argument which shows that thought resides in a dimension higher than the brain.

212. Thought can be transmitted and received.

Even in a space with four dimensions, vibrations are possible, and whenever we think, we seem to send out impulses, which travel from us outwards in all directions, like wireless waves. Love and hatred appear to be the mirrors with which we can focus these waves in a particular direction like beam wireless, and if another man at the other end has a sufficiently sensitive receiver he may be able to read our thought direct. That is perhaps what happens, when we give our offerings to the dead or address God in our prayers. Have we not been told a hundred times, that it is not the sugar and sweets that travel but our love and devotion—our feelings and thought? This question of thought transference has recently been experimentally studied, and there is enough evidence to convince an unbiassed mind, that it is a fact in nature. All the time we think, we transmit, nay—cannot help transmitting thought which affects people round about us; and the invisible, but all the same real and incessant pressure of all these thoughts constitutes—"communal tension" and "public opinion." Well-directed and powerful thought currents from Prophets have changed the course of the world, and in "thought," we have yet undreamt—of power, which we can use for weal or woe. In mentioning this it is as well to keep in mind, that evil thoughts or thoughts of hatred generally get reflected, and recoil upon the sender ; and people

who deliberately try to dig graves for others sleep in the same themselves. If all this speculation is correct, thought would appear to be our sixth sense, which would need a receiver and transmitter, and the pitutary body and pineal gland may be answering that purpose.

413. Man responds to stimuli.

We have so far considered the manner in which man receives information about outside objects. He correlates them, tries to understand them, and then responds to them—sends back his own reply in five ways. He moves parts of his body or the whole body, receives food and throws out what he does not want, conveys his thoughts to others by speech and writes them down with his hands; and tries to reproduce himself in his off-spring. He also sends out thoughts direct as we have already seen. Of these, speech and writing are the special peculiarity of man, but all other animals respond in the remaining four ways. All plants excrete and reproduce, and some move their leaves towards the sun, or to close them at dusk and to catch insects. Dr. J. C. Bose has now proved that both the living and non-living respond to external stimuli exactly alike, the only difference being of degree. The behaviour of all Life, whether encased in a mineral, vegetable, animal or human sheath is essentially the same. We have already seen how all matter is the common property of the whole creation, and it is only natural that all life should be one and indivisible.

214. Man's motor activity.

Man responds to stimuli and acts as a transmitter through his muscles. We have already seen how movement is obtained by the contraction of the appropriate muscles and how each muscle is composed of innumerable engine cylinders, which are ready charged with fuel at all times and which explode on receipt of orders from the inner man. These are sent out along motor nerves specially provided for the purpose. The telegraph wires along which commands are transmitted to the muscles are similar to those along which sensations are conveyed to the brain; but they form distinct sets, which are laid side by side. Messages travel only in one direction. The sensory set brings in information, which the Inner man percieves. He thinks over it, and issues his firmân to the various engines. But the demands on his attention are so varied and countless, that it is practically impossible for him to go into every detail, and as nerve currents travel only a couple of hundred feet per second, it means a distinct delay. Like a wise administrator therefore, he resorts to decentralisation. In addition to the central exchange in the brain, he has small local exchanges at every junction, which act almost in an automatic manner, and directly issue necessary and suitable instructions in most cases, without awaiting orders from the central station. Unlike human officials, copies of every petition from the humblest citizen are sent to the King, for his perusal. But the inner man generally confines his attention to the more important things

and in some cases he may ponder over all the evidence collected by his senses, for days and months, and even try to attune his thought-receiver, to catch inspiration from higher sources, before deciding upon a course of action. The outer senses are generally so loud and insistent, that to quieten them for a short time, to hear the " inner voice ", is not only no superstition, but the application of a scientific truth of the highest importance. Thus does man control his voluntary movements.

215. Routine matters and health.

Apart from such weighty questions, there are a number of routine matters, like the pumping of the blood, breathing, the assimilation of food, excretion of waste products and carrying out repairs, etc: which are very necessary for the well-being of our body as we have seen, and these must continue without interruption. These are therefore carried out by a set of "involuntary" muscles. The inner man never interferes in these, and in fact seems to have lost the power to do so, although instances of yogis, who can stop their heart-beat are not unknown. As no muscles will contract without stimulus, and no motor nerve will send a current unless it is excited, it is clear that there must be something, apart from all sense-impressions, which constantly pokes at them. The words "automatic" and "sympathetic" satisfy western doctors; but according to the eastern teachings that is the function of "Prana" a form of Solar energy, similar to light or electricity. These rhythmic pulses in four-dimensional matter

are caught by a receiver acting in the proximity of the spleen—the Solar Plexus, and thence differentiate into three, five or seven (as differently stated) streams and it is these streams which govern all our activities—both sensory and motor including the sympathetic system. Switching on of this current is "life"; cutting off "death." In the eastern system of medicine this life-energy is taken as dividing into three chief streams. These govern assimilation, glandular secretion, and excretion known as Vâta, Pitta and Kafa respectively, which certainly are not "wind, bile and expectoration"; and it is by the equilibrium of these three that proper health is maintained. The eastern physician therefore looks to the cause of the disease while the western doctor treats from the symptoms. This subject is very little understood, and perhaps it is as well that it is so.

216. Man wants to reproduce.

Another motor activity of man is the desire to reproduce himself. This is a characteristic of all living beings, without which the three-dimensional creation would cease to be, in a hundred years' time. The desire to reproduce is therefore strongly implanted in all living beings, inspite of some necessary pain involved in the process. We have seen how cells multiply by division. We are told in the ancient Puranas that human beings at one time in the history of the world got off-spring by "budding". Later on they developed sex, but like plants

they were for a time hermaphrodite —having both sexes in one body, of which we see a remnant in man having undeveloped mammary glands. The functions of the two sexes being so different each individual specialised only on one side. After this it is said that man could lay eggs, as birds do to-day; but all these forms are now past history—whether actual or symbolic we do not know. In man now, the child is carried in the mother's womb, and blood circulation through its body is maintained by the mother's heart pump, until it has grown sufficiently and can carry on an independent existence. Man secretes sperm cells, and woman ova and it is only when one of the former reaches an ovum, inside the uterus and the two fuse together, that the new life begins its existence. Neither cell by itself can start new life. They must meet and fuse inside the chamber where they can attach themselves to the wall, and be further nourished and protected. The sperm and the ovum are both indispensable, but if they were the only factors we would not have so many childless marriages. Like the two contacts of an electric switch, they are doubtless essential, but they are not electricity, nor is Life contained in the sperm and ovum. The switch may be closed a hundred times, but if the voltage is not there no current will flow. It is not therefore unreasonable to suggest that the sperm has in reality a tail much longer than the one shown by the microscope—a tail extending into fourth dimensional matter. Everytime man attempts to reproduce, he is really probing the ether for an

Ego—a unit of consciousness, a soul, who is willing to be born of him. Only if he finds one, is the current of Prana switched on. Life processes begin. The cell formed of the fusion of the sperm and ovum begins to divide. It multiplies itself a millionfold. It differentiates into bones, muscles, nerves and all that. Matter, as it were, pours into a mould, in a symmetrical manner because it comes in from the fourth-dimension and lo ! The the greatest magic that man knows of is accomplished. Man reproduces his own form—as a house for another "man" to live in.

217. Man communicates his feelings and ideas.

Man is not content to live alone as we have tried to describe, but he wants to communicate his feelings and ideas to others. He does it by converting them into sound waves, for which he has been provided with a very delicate reed instrument, the larynx. We saw that lots of idle spectators enter our oxygen market, but once they enter our lungs they are caught and used to set our larynx into vibration. The slit can rapidly open and close sending out alternate gusts of wind, starting sound waves, which propagate in all directions. The tone of the sounds produced can be further varied by the position of the teeth, the vibrations of the tongue, and by closing and opening the lips, giving us the various vowels and consonants. These are generally lumped up in different languages, but in Sanskrit they are all arranged according to the modifying cause—labials, gutturals etc : It is said that these

different sounds are connected with different invisible forces, and on a correct understanding of these depends the use of Mântric syllables like "Aum" "Rhâm" etc. which to a modern man appear as so much jargon and nonsense. It is said that the creation began with the word, the Logos; and it is a matter of common experience that we can create or kill with our tongue. Of course the spoken word includes the written word, which we all constantly use, to get into touch with the rest of the world ; and that is the only transmitter that man has got, besides the one for sending out thought direct.

218. The Inner man.

We have seen that all knowledge depends upon three things—the transmitter, the medium and the receiver. We all recieve through the five senses, and transmit chiefly through speech. The medium colours all our transactions, which are also affected by the imperfections of both transmission and reception. As long as we have to depend upon vibrations in this three dimensional world we can not know what things really are. It is all waves, waves and waves. They strike us now as sound, now as light ; but perhaps they are all the same. Persons have claimed that they could see colours when a symphony was played ; and in others a succession of coloured beams seemed to produce the effect of music. That may be a mere hallucination, but if we always "interpret" an inverted image on our retina as an erect one all our life, there seems to be nothing

impossible in seeing red or green when we hear certain notes. Apart from all instruments stands the Inner man whose power of understanding is so subtle, that he can get accustomed to any vibration he likes, in a moment's time. In London a man will "keep to the left" and next day in Paris "keep to the right" with perfect ease. The outer world exists and we have to understand it as best we can, but it is only the eighth part of the iceberg above the water. It is at least equally wise to pay some attention to the real man—the INNER MAN—the Jiva, who is conscious in four dimensions, or perhaps more.

XXII. PLEASURE AND PAIN

219. Pleasure expands: Pain contracts.

As the various sensations pour into the brain, man pools them together as we have seen, and in this jumble, the memory of previous incidents of a similar sort are also included. That now becomes a new experience. Quite apart from the exact details of this, the effect of this new event on him can be broadly classified as agreeable or otherwise. Would he like to repeat it? If yes, it is said to give "pleasure." If he would rather not go through it again, it is full of "pain." When a man is happy he somehow seems to expand, to grow lighter and more buoyant and his face broadens. He feels like walking on velvet: he is elated: he goes with a sprightly step: he is gay as as a lark: he giggles: he bursts out into laughter. When a man is pained he appears to shrink: he sits down with a heavy heart: he is depressed and puts on a long face. He is in the dumps: he is dejected: his tread is heavy: he is dull as a beettle: his eyes are cast down: he is gloomy: he whines: he melts into tears. All these are not mere figures of speech. These oft-repeated phrases embody greater truth than many imagine. If we accept that man is "born" by the switching on of the "Prana" energy, pleasure can be expressed as an increase of the current—greater input of energy from the four-dimensional world. Pain is the reverse of this.

A happy man literally lives a fuller life, lives abundantly. He shrinks and shrivels when pained. Pleasure like heat expands: Pain like cold contracts.

220. Harmony and discord.

Our bodies are formed of physical matter and perhaps associated with it is some other tenuous matter of which the four-dimensioned world is formed. Now each particle of matter has its particular period of vibration, depending upon its mass, and the force which keeps it in equilibrium. Particles which move together in harmony attract each other. If they move out of tune like soldiers who cannot keep step, they bump against each other and are thrown out. That is a great fact in nature; and is true not only of particles, but of collections of particles, the periodicities of which can be compounded. Every thing in nature can thus be said to have a note of its own, and where the notes do not harmonise things cannot hold together. This fact is made use of by the housewife to separate small stones and sand from rice grains. Even a human being can thus be said to have a sort of note or individuality of his own, so that another person feels attracted to us, only if we can strike "the chord in his heart." Harmonious vibrations can build up greater amplitude and give pleasure. Discord jars and causes pain.

221. Nothing pleasurable or otherwise *per se*.

Pleasure and pain is all a question of harmony between two notes: and both the notes have to be

taken into consideration. It takes two to make a concord or a discord, and it is only the contact that is agreeable or otherwise. We thus see that some things which may gladden the heart of one person may have no effect on another. If we are in the habit of taking strong drinks, the alcohol particles within us would be very pleased to meet their cousins in another glass; and only a smoker will relish tobacco fumes. Wonderful dance music which may throw an Englishman into raptures will make an Easterner feel jumpy, whereas the Westerner may call our songs as so much whining. It is not every Indian who can enjoy "scientific" Ustâdi music, or appreciate the paintings of the modern Bengal school. Again a thing may please one and actually pain another. Some men feel a strong nauseating sensation, if they have to stand near a place where onions are being fried or kabâbs roasted, whereas these smells only make the mouth of another water. Then again some thing may be very gratifying at one time and not so a few minutes later. What is palatable and delicious when a man is hungry is so much carbo-hydrate immediately after a heavy meal and the thirty-fifth Laddu or piece of chocolate does not taste as sweet as the first one, and may prove a positive torture. Dolls which captivate a girl at one time pall on her a few years later and a man will often change the hobbies that fascinate him. All these things point to the conclusion that nothing in the world is either "pleasurable" or "painful" *per se*-by itself. It is its coming together—its meeting with the Inner man that gives the sensation of pleasure or pain.

222 Pleasure comes from within.

The recurring wants of the physical body hunger, thirst and sleep if unsatisfied may cause pain. Whatever the station of life a man may come from or whatever his habits, the pain due to real hunger and thirst will be the same; but the pain stops as soon as the deficit is made good. Any wholesome food will meet the demand of hunger and wine is not necessary for quenching thirst. These are appetites, but apart from these, there is such a thing as a palate, and the relishing of different flavours. All these depend upon the actual addition of suitable physical matter to our body; but that is not the only source of our happiness. We may be charmed with some delicious fragrance wafting on the breeze; and go into raptures with melodious music that may float into our ears. A foolish word from our cousin—mere vibrations in the air—may give intense pain, and rankle in our heart for months, or a horrible sight once seen may make us miserable for years. In these cases there is no real accretion or decrease of matter. It is like an increase in the amplitude of our vibrations—a question of tone or loudness—in which memory plays a very great part. In both cāses it is no doubt the external stimulus, fluid, gaseous or mere vibrations, that calls forth an inner response; but it is the latter, the increased current of Pràna which comes from within (the fourth dimension) that is the real source of our happiness. If we pause awhile to analyse the stupid physical sex act we would see nothing in it to justify the maddening influence it has on all animals, including human

taken into consideration. It takes two to make a concord or a discord, and it is only the contact that is agreeable or otherwise. We thus see that some things which may gladden the heart of one person may have no effect on another. If we are in the habit of taking strong drinks, the alcohol particles within us would be very pleased to meet their cousins in another glass; and only a smoker will relish tobacco fumes. Wonderful dance music which may throw an Englishman into raptures will make an Easterner feel jumpy, whereas the Westerner may call our songs as so much whining. It is not every Indian who can enjoy "scientific" Ustâdi music, or appreciate the paintings of the modern Bengal school. Again a thing may please one and actually pain another. Some men feel a strong nauseating sensation, if they have to stand near a place where onions are being fried or kabâbs roasted, whereas these smells only make the mouth of another water. Then again some thing may be very gratifying at one time and not so a few minutes later. What is palatable and delicious when a man is hungry is so much carbo-hydrate immediately after a heavy meal and the thirty-fifth Laddu or piece of chocolate does not taste as sweet as the first one, and may prove a positive torture. Dolls which captivate a girl at one time pall on her a few years later and a man will often change the hobbies that fascinate him. All these things point to the conclusion that nothing in the world is either "pleasurable" or "painful" *per se*-by itself. It is its coming together—its meeting with the Inner man that gives the sensation of pleasure or pain.

are all persons who live at a high pressures, who live abundantly. Their joys are great and so are their sorrows.

224. The Supreme Happiness.

Cultivation of Art thus enables us to derive great pleasure, with very little external stimulus; but perhaps with the exception of poetry, the poking from outside is necessary. One peculiar fact about all pleasures derived through the senses is that they are subject to fatigue and hence they all pall. All pleasures being in the nature of harmonious vibrations there never can be any real satiation, but the fatigue is often felt as such. Yayâti has after long personal experience told us that it is as futile to expect the senses to be satisfied as it is to imagine that a well-lit fire will be quenched by periodically pouring ghee into it. That is why, man has tried to make happiness independent of these, and the ancient Sages tell us that it is quite possible to do so. The joys, they say, can thus be increased a hundredfold. One method is to communicate with the other jivas direct (to learn to feel happy when others are happy) to take our delights, as it were, through other people's senses. Our own sense organs will of course bring in their reports; but these are to be used only to understand the problems of the other man. The rest are to be taken just as they come, as mere experience to be recorded, just as a thermometer measures heat and cold without being affected by them. If a man can reach such a state of consciousness, the Rishis assure us, that his happiness is multiplied

taken into consideration. It takes two to make a concord or a discord, and it is only the contact that is agreeable or otherwise. We thus see that some things which may gladden the heart of one person may have no effect on another. If we are in the habit of taking strong drinks, the alcohol particles within us would be very pleased to meet their cousins in another glass; and only a smoker will relish tobacco fumes. Wonderful dance music which may throw an Englishman into raptures will make an Easterner feel jumpy, whereas the Westerner may call our songs as so much whining. It is not every Indian who can enjoy "scientific" Ustâdi music, or appreciate the paintings of the modern Bengal school. Again a thing may please one and actually pain another. Some men feel a strong nauseating sensation, if they have to stand near a place where onions are being fried or kabâbs roasted, whereas these smells only make the mouth of another water. Then again some thing may be very gratifying at one time and not so a few minutes later. What is palatable and delicious when a man is hungry is so much carbo-hydrate immediately after a heavy meal and the thirty-fifth Laddu or piece of chocolate does not taste as sweet as the first one, and may prove a positive torture. Dolls which captivate a girl at one time pall on her a few years later and a man will often change the hobbies that fascinate him. All these things point to the conclusion that nothing in the world is either "pleasurable" or "painful" *per se*-by itself. It is its coming together—its meeting with the Inner man that gives the sensation of pleasure or pain.

XXIII. EMOTIONS—THE HORSES.

225. Diversity of Response.

We have seen that pleasure and pain are not properties of matter, but are entirely the result of its contact with Life, with its own vehicles of matter. If the impact is harmonious the jiva likes to repeat it—it attracts him. If therwise, it repels him. In each case his motor response is governed by this feeling. Now the impulses that come in do not always come from inert matter but from other foci through which Life seems to act—other jivas, and we very soon begin to confound the vibrations with their transmitter. So we transfer our attraction or repulsion to the other man, who is the source of those waves. In this, the memory of previous experiences plays a very great part. It creates in us certain expectations, which further colour our response. We thus gradually come to develop a certain attitude, which we habitually adopt towards men and things; but as this depends upon us as well, exactly one and the same incident may have quite divers results on different people. Imagine a man knocked down by a tram-car. The first effect of that unusual accident is to attract the attention of the passers-by many of whom would simply rush in and surround the victim, and even shut out from him the fresh air he badly needs. One man may help the injured man to get up; or try to stop the flow of blood from his wound. A second

may run for a doctor, or a third consider it best to take him to the hospital and so he may go out to secure a carriage. A fourth may be so overpowered by the sight of the red blood that he may sit down on the pavement and weep. A fifth may be inspired to write a poem. A sixth may take down the number of the tram-car and the name of the driver and start quarreling with him, so as to fix the responsibility of the accident. A seventh may hurriedly run away from the spot, lest the police call him as a witness. And yet another, who may be simply looking on, may be sending out strong thoughts of peace to calm the excited crowd, and be pouring strength into the unconscious man to help him to bear his misfortune bravely, without getting bitter about it. Such would be the response called out by exactly the same event and its nature will depend upon the rate of vibrations that each individual has builded into his body.

226. Emotions are like horses.

Such a response that is habitually evoked in a man is called an Emotion—that which moves out of him. We likened our body to a machine, then to a huge city in order to understand the working within it; but now when we come to emotions we realise that after all the physical body is not as important as it appeared to be. Half-a-dozen strong men may find it difficult to hold down a very weak maniac; and instances are not unknown of mothers in the most feeble condition of health doing most super-human feats to save their

children. An orator by suitably modulating his voice and by his emphatic gestures appeals to the "emotions" of his vast audience—now of pity, now of patriotism—and makes their blood boil, while the poor physical bodies of the listeners stand stock-still and even breathing appears to stop. Mahatma Gandhi with his 90 lbs. of flesh kindles the flame in the hearts of millions. Such is emotion compared to which the physical body is but inert matter; and that is why the ancient Sages have compared the former to horses, which drag the latter—the carriage—whither they will.

227. Love and Hatred.

We have seen that emotions are rooted in pleasure and pain, likes and dislikes, attraction and repulsion, love and hatred, and so Dr. Bhagvandas of Benares has shown that they can be best classified under these two heads.* He suggests that every feeling of attraction or repulsion in our mind is mixed up with a consciousness of our inferiority or superiority to the object of our emotions. A man dislikes both a mosquito and a tiger, but his emotion in either case is not the same. He would feel like annihilating the former, but a glimpse of the tiger ready to jump at him will induce him to run for his life, or even paralyse him and root him to the ground in abject terror. In both cases it is a feeling of repulsion but it expresses itself in

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* The Science of Emotions by Dr. Bhagvandas, Theosophical Publishing House, Adyar, Madras.

different ways. Even in the case of a tiger attraction is possible. There is the story of Shivajee who was once asked by his guru to bring milk from a tigress and he boldly approached one and milked her. Then there is the experience of Swami Rama Thirtha whose emotion of love was so perfect, that wild tigers used to come and allow themselves to be patted by him. His dominant note actually overpowered the tiger's repulsion for man.

228. Variations of these.

Then this superiority and inferiority may be moderate, great or immense ; and it is also possible to imagine a relationship of equality which may be slight, average or perfect. Our feelings in each case will thus vary and so will the outward expression in each case as shown below :—

Variations of Love.

Superiority of object	Feeling	Outward expression
Immense	Worship	Prostration
Great	Reverence	Low bow
Moderate	Respect	Bow
Equality.		
Slight	Politeness	Handshake
Average	Friendship	Presents
Perfect	Conjugal love	Embrace

Inferiority.

Moderate	Kindness	Smile
Great	Tenderness	Caress
Immense	Compassion	Tears

Variations of Hatred.

Superiority.

Immense	Horror	Paralysis
Great	Fear	Run away
Moderate	Apprehension	Shrinking

Equality.

Slight	Rudeness	Keep off
Average	Anger	Sarcasm
Perfect	Wrath	Suppression

Inferiority.

Moderate	Self-importance	Look down
Great	Scorn	Sneer
Immense	Disdain	Crushing

These are but simple emotions but our feelings are often complex and Dr. Bhagvan Das in his admirable book on the subject has shown how these can also be fitted into this method of classifying them.

229. Love and hatred for the Jiva or his vehicles.

Perhaps it would be easier to understand the complex emotions, if we take into account another fact, which Dr. Bhagvan Das does not bring in, *viz.*, that an individual means the inner Jiva and his vehicles. It is so difficult to distinguish between the two that we generally mix them up together. In one person's case they might be for practical purposes be taken as acting together; but it is quite possible for one man to love another's body and at the same time feel an actual repulsion for the Jiva within and *vice versa*. If one Jiva—a man—loves another Jiva—say a woman—he would take delight in everything that makes her happy. Suppose the woman is doing something which pleases her very much for the time being, but the man with his unclouded vision feels that it will bring on her great misery in future, it will be his duty to warn her of the danger. Even her passing fancy will create not anger but a kindly response in the man's heart; but he will try to do everything he can do disuade her from following that whim. Suppose the man is afflicated with a deadly disease like cancer, not yet publicly known, he may refuse to marry her, and use all his influence to persuade her to marry some one else, or even behave towards her outwardly in a very rude and offensive manner, so that she may be reconciled to the other person. He will do all this out of pure love for the Jiva, feeling happy when she is happy. A doctor, in spite of the natural repugnance he is bound to feel towards the body of a leper, treats him at personal risk. He

may cut open another man's abdomen, binding him down and chloroforming him in an apparently cruel manner. In both cases the emotion is essentially of love towards the jiva, which drowns the mild repulsion for the vehicles.

230. Love for the vehicles.

Take another instance of a rich man, in the prime of youth, who goes to the Follies Bergere and "falls in love at first sight", with one of the stars, which shine even in the dazzling glare of the footlights. The *Prima donna* also discovers that the millionaire is *the* man God had created for her. She is willing to forego her career, for a quiet life and so they marry. He buys for her a new dress every day, and is delighted to see her literally roll in velvet and satin. They breathe the bracing ozone of the sea in their own yacht, and in their Alpine villa all the snow-clad mountains, green verdure and wonderful flowers spread out before them. Their intoxicating scent wafts on the breeze; dance raises them to the sixth heaven and sex completes their felicity. The man dotes over the woman and the woman loves the man, and they are both supremely happy. Is it an attraction between the Jivas or the vehicles? How shall we classify it? Let us wait three months. The senses always are subject to satiation and fatigue. The greatest pleasures soon pall on them and the pair are rather morose and go to a hotel for some company. When the sense-telephones begin to ring slowly, the memory which is always active becomes louder. Fleeting shadows of the

green room float before the actress' vision. One of these forms materialises before her in the shape of a handsome lad she used to like once. She is surprised to meet him on the *piazza*, but her face brightens up. She invites him to her rooms and introduces him to her husband, who is struck by the light in her eyes. But this fire kindled by the stranger does not give the husband any "pleasure" this time. On the the contrary, it rouses in him a feeling of repulsion for her friend, who seems to have come to rob him of his "love." How can "love" be stolen? The fact is that the husband is afraid of losing those hundred pounds of precious flesh. He determines to prevent it, and puts a loaded revolver in his pocket, and spends his whole time watching the other two. After three days' agony, he finds them exchanging a kiss and in a second, he puts a bullet into the man's head. The wife gets very frantic and grieved; the man falls down at her feet and vows to her eternal love, and repeats that he wants "her." She is disgusted and throws herself down from the window. The cold clay, the property of the husband, is again restored to him. He has "her"—but that lifeless form is no use to him, and he spends the remaining days of his life, in a lunatic asylum, telling the world of his "love," while his "beloved" completely cured of any "attraction" towards her husband, wanders away in space, perhaps with her second friend. That is clearly a case of "love" for the flesh and the Jiva comes in only in as much, as it is necessary to keep the flesh warm.

231. Love and Lust : Indignation and Hatred.

We thus see that attraction and repulsion, love and hatred can both be twofold—jiva towards jiva, and jiva towards vehicles. There is a tacit understanding in the mind of humanity—whatever our materialists might pretend—that man is something more than his body, and so every one likes to convince the world that he is not dealing in flesh, but with the Spirit within. People therefore do not like to use the words lust, or hatred (about themselves). Our millionaire says he "loved" the lady, and it was only righteous indignation that made him stop the third fellow from making her unhappy This sort of thing has given rise to a great deal of confusion and hypocracy which makes progress difficult. The first right step therefore is to understand what our emotions are, by using separate words for the two. We should reserve the words:

Love—for attraction between jiva and jiva
Lust— do do do and vehicle
Hatred for repulsion between jiva and jiva
Indignation do do do and vehicle.

These can be further subdivided as Dr. Bhagvandas has done according to the superiority, equality or inferiority of the other jiva, which again may be different as regards different attributes. Thus the feelings of the millionaire in the last paragraph can be put down as:

Lust for the flesh of the woman, accompanied by—

(a) a sense of her superiority as regards good looks, for which the man may 'worship' her;

(b) a sense of his superiority in having the gold, which makes him 'tender' towards her;

(c) hatred towards the third person tacitly admitted as his perfect equal, and hence expressed as "wrath".

All these combined together give him intense jealousy, which results in murder. If the third party were a dog, definitely known as an inferior, the husband would not get angry, although he might feel slightly envious of the attention bestowed on it by the lady. All these factors will enter into the resulting emotions, which generally are very complex. But with these amplifications, I think, we are in a better position to analyse and classify them.

232 How emotions develope.

The emotion, or outgoing response is not an end in itself, but an attempt at reproducing or avoiding the sensation received. For this purpose one jiva may seek to obtain complete possession of the object, as in the case of food, or try to annihilate it as a pest. In many cases that is not possible nor desirable, and so the jiva tries to dominate the other jiva whose presence alone can keep the other vehicle going. Herein lies the possibility of repeated pleasure, as in sex, and that is why that creates a far greater emotion than food, which can be eaten only once. When desire is turned outwards towards the senses, to the vehicles, it is cal-

led *Kāma*—lust, or *Tanhā* thirst. All our passions are derived from it. A faint desire to contact leads to "curiosity", an inclination to peep, and if a jiva is allowed to do so, the curiosity may vanish. But the slightest resistence increases the desire, and the word "confidential" on a cover is enough to ensure a letter being read by many people, who otherwise would not care to look into it. If the interference is greater, to our *Kama*—lust...is added the desire to conquer the jiva, who stands in our way, and we call it *Krodha*...anger. The more we are thwarted the more we dote on a thing and we develop *Lobha*...greed: and this warps our judgment. We become infatuated; we are struck by *Moha*. That leads to intoxication *Mada* and it is curious to observe that satisfaction of desires, especially if it comes suddenly and against our expectation, also leads to the same state of intoxication, through pride of our great achievement. Our vision is entirely clouded. We then become jealous. *Matsara* enters us; reason ceases to guide our actions. After that, the deluge. It is time to break up the vehicles which have thus hopelessly landed us in this mess, perchance to begin again. That is the road of Vice.

233 Virtue and Vice.

The other one is the path of virtue. If instead of turning our desire outwards we look to the jiva direct, our attitude towards life at once changes. We become happy, when we see the other jiva pleased. If he should happen to want anything, we give it and give it freely. As soon as this attitude of love

is properly established, says *Patanjali*, other people forget their enmity towards us, at least for a time. We give away money, and wealth begins to flow into our hands. Maximum pay for the minimum wages was the law of our old-world economics. Now Henry Ford pays his coolies better and reduces prices : more orders begin to pour in, and he gets richer at the same time. Anger and greed become quite unnecessary. The vicious circle is broken. The reign of Virtue is established. Spirit has triumphed over matter. Love for the other jiva and indignation for his vehicle if it is unworthy will yet remain, but lust and hatred will be gone. How to achieve this magic is a problem that has taxed the brains of humanity ; but we have the testimony of history that this miracle can be. How, we shall try to understand ?

XXIV.—INTELLECT—THE CHARIOTEER.

234. Our Recording Angel.

Quite apart from the feeling of pleasure or pain that sensations rouse in us, inside us there is a recording apparatus which registers every impression that comes in, and files it for future reference. We have already seen how the record-keeper is in the habit of reading aloud his old records to us, on the slightest pretext. We shall now try to study how the Recording Angel works in his office. He obviously has a staff of very efficient shorthand writers who can take down the messages as fast as they pour in through the five telephones. All notes are written in indelible ink and not even the faintest flicker is forgotten, although at the time, we may not be conscious of it. Thus a Saturday night's record of a drunkard, who had decided never to drink again, would be something like this:—

"Received pay at office. In accordance with the vow made the previous day at public meeting, started for home at once. Took a different road to avoid company.....but how did these men know of it!.....No, I can't avoid them.....I will face them boldly.. .. "Yes, I am going home, I am not going to drink any more".....'Come along, don't be a fool".....'Alright I will come in, but I am quite sure I won't drink".....Went in. Beer? What fools! "When I used to drink

I never took anything weaker than neat whisky." "No, No, I don't want whisky." "But I brought one for you, Sir." "As usual, Sir, I opened a new bottle for you." "Alright I will pay for it, but I won't take it." How stupid to throw away a good glass, and lose the money as well. No, one glass won't hurt me.....but one only.....Felt very pleased. A new drink! Let us see. I am now quite sure, I can leave off. Get me a glass. I will take only half of it, and prove to you that I can resist the temptation..... Took just half. "No you don't believe it. Prove it. Prove it. Prove it", I say, "Prove it, you blackguard or shall I....." Thump on the head.....that second glass must have been very strong wine. No. the earth is shaking. Oh! these earthquakes. (Telephones stopped working suddenly ..... waited hours) Yes. a throbbing sensation in the head.....a broken arm... Where am I? In my bed! How did I come in here? I had my whole month's pay in pocket. Is it there?No: I have been robbed Blackguards.I remember now. No, I shall never drink again'. and so on. Quite a number of similar records will be filed before the man really leaves off his drink.

235. The Stenographer writes as he understands it.

Births and deaths, marriages and funerals, feasts and fasts are all the same to the stenographers. Their business is to write. They go on scribbling the news, as it comes from the North, East, West and South. We have already seen how our various telephones first of all distort the impressions.

Then there is "fading" as well. The beats are loud and strong both when we feel great pleasure or intense pain, and weak and feeble when they fail to arouse our inner jiva. Then again it is so hard to prevent the record clerks from reading aloud their old files, that the stenographers often mix up the noise inside the house, with the sound that is coming in. So a really accurate and perfectly truthful record of any event is very difficult. It we asked all those eight persons, whose emotions after the tram-car incident we analysed before, to write out an accurate account of the accident, we shall get eight different stories,and quite honest ones too. We all look at the world through our prejudices, and prepossessions and our understanding is always coloured by our wish to believe. The Times of India correspondent will see in a Congress meeting only 300 people, whereas the Bombay Chronicle man will swear to 3000. That is inevitable. If one of these eight perons was related to the injured person his version would be very emphatic, and that is just why a judge, whose object is to get at the truth, would not attach much importance to his testimony. He would select the most "disinterested" person, i.e., one whose emotions were ruffled the least, and give the greatest weight to his impression, in apportioning the blame. Real truth is impossible until we rise above both pleasure and pain : till then we can only "experiment."

236. Association of ideas.

All the stenographer's notes are at once transferred to the record room. We can understand

the filing system followed in this department best by observing the beginning of the process in a child. After birth the child is hardly self-conscious for some time, but soon its telephones get into working order. The food it takes in is used up in the body and the first urgent message that the brain gets is that of hunger—a painful sensation. The response is "crying." In a minute the eyes of the baby report the arrival of another person, who takes it up gently (so says the skin) and puts it to her breast. The child sucks milk, and is soon satisfied. It now notes the source of the food more carefully—the mother's form and her face, and being in a happy mood, i. e., with strong life currents, they make a deep impression on it. The only meesages received loudly are "Hunger-mother-satisfaction"; and these are all filed together. We have seen how the record-keeper takes delight in reading aloud his files, and so the next time the word "hunger" is whispered, he reminds the exchange of the mother; and what is curious when the eyes announce the mother a few minutes afterwards, it reads out the chapter on hunger, and the child begins to cry. "Hunger-pain-mother-pleasure" are so mixed up in the child's memory that any one brings up the other. *The ideas are associated.*

Another very interesting study is the memory of a horse. Suppose we beat a horse very severely somewhere on the road. It is very dimly conscious of our existence, but it vividly sees the curiously shaped tree in front of it, and the record-keeper in its brain records "that tree-intense pain in the back". Next time we go there the image of the tree reminds

the horse of the whipping, and its reaction is to stop. A foolish driver whips it once again, and that only confirms the idea in the horse's brain. Every lash adds to the supposed connection between the tree and the pain, and the creature will naturally refuse to budge an inch, until that association is broken. A wise coachman will therefore get down and pat the horse on the neck. The brain record now runs—tree, pain, patting, pleasure; and the animal begins to wonder what is really correct. It will walk a couple of steps and stop again. Another caress confirms the second impression, the new association gets stronger, and the horse will go on without any further trouble. That is why, every wise owner of a horse offers the horse some choice morsels, with his or her own hands, the circus trainer always feeds the tigers, and kings grant knighthoods and titles themselves.

237. Memory—a network of channels.

Memory appears to be like plastic clay, on which every impression makes a small rut through which life-currents flow, and the passage being continuous, these channels are all interconnected. Our second experience does not necessarily follow the same sequence, but it might touch the first in some points. All these grooves therefore cross, and recross each other, and our whole brain is, as it were, covered by innumerable furrows, forming a very intricate network. When the waters of Life pour into any one of these trenches it naturally tends to overflow into all connected galleries. There is no rhyme or reason in the linking to-

gether of ideas, and anyone can verify this for himself by watching the sequence of his thoughts for a few minutes. The following is nothing extraordinary.

"I see a cat—oh, yes. It has come for milk—ten seers my cow gives—quite. I must arrange for grass—it is so costly—why not get some grazing. Yes, how beautiful was the grass-land as Lonavala, wonderful, but it was there I had the accident and broke my arm. Yes—the bandage and the dirty iodoform—I can almost smell it now—no better than a bad privy. Oh, the wretched closet in our house and the wretch of a landlord ! He wont improve it—these capitalists, and they want such high rents—of course rent act must be passed—legislature again—but what bad acoustics has the council hall got—our College theatre is very much better—Did not I build it?" and so on. If we recall our dreams, we shall find some most astounding association of ideas. All we can say is that generally speaking a time sequence can be observed between two succeeding lines of thought and that our thoughts mostly centre round ourselves, all wanderings tending to come back to ME and MINE. Such is memory, a very intricate network of channels made by previous experiences That is the function of *chitta*—that which collects—the filing department.

238. Making a deep rut—Observation.

Not all the furrows made in our brain are always of the same size. First of all the depth of a rut depends upon attention—the interest we take

in it—the intensity of the Life current. We have already seen how this is affected by pleasure or pain. That is why educational toys make the children happy, and all orators begin by praising their audience and putting them in a pleasant mood, thus securing their attention. A student's mind may wander through his studies for hours, and yet the impressions in his brain will be very faint. If he cannot attend, the reading of books is worthless, and he might as well go out and have some vigourous physical exercise, when his blood will circulate faster and the brain may work better. If we want the memory to retain anything we must make a deeper groove and for this we must secure attention—observe accurately—making the fullest use of all our senses. There is a great deal to observe in the smallest match-box and see how it differs from another. Looking at motor cars to observe how their shape, and contour varies is very interesting study; and it is not impossible to distinguish between cars of different makes at a glance from a distance. Even the so-called illiterate villagers can by training their observation find out their sheep or camel out of hundreds of similar animals which look all alike, and instances are not unknown of "puggys" who can follow the faintest foot-prints for miles. It is only by very careful observation that an artist can see not one but a multitude of noses, as he wanders along the market place; and it is by developing the same faculty, that an engineer can visualise beforehand the buildings he is going to construct. Such concrete memory is

seldom associated with plea[illegible] the most difficult. But that is the real begining of all intellectual training—attention, observation, visualisation—making a deep channel in the brain. It is useful to remember that in childhood the brain is more plastic and the impressions made then go down deeper and last longer.

239. Keeping the groove—Recapitulation.

Our mind seems to be formed of matter like pitch, so that a furrow made in it tends to close up with time. Even a ghastly wound will heal after days, and time brings forgetfulness to cover up our greatest sorrows. The impressions then made gradually get filled up; although they never are fully obliterated. Whenever we go over the same in thought, the waters of life flow through them, and they get deepened again, and so by brooding over our misery we greatly intensify it. Worry kills. That is a wrong use of repetition; but that is the Law. It is only by constant revision that we can keep the rut, and make it wider. If we read for five minutes and then try to recapitulate what we have read for ten, we can remember it much better. In mental repetition the whole energy is derived from inside and so we cannot be inattentive. We try to carry our thought again and again along the groove made by the author in our brain. In hearing a lecture it is possible to be 80 per cent absent-minded; in reading slowly we have to fix it perforce to a greater extent, but we cannot run over the ideas mentally with a distracted mind. Hence the great value of mental repetition—recapitulation.

240. Make some well-worn paths.

Now in all these impressions we always notice some sort of sequence in time or space, and events always seem to follow in that succession. So certain associations like George Washington and his axe or the Gandhi cap and the lathi soon establish themselves in our brain deeper than others, and it is wise to take as much advantage of this as possible. If we are asked to remember the following fifteen words : "Noise, hand, terror, ink, colonel, thunder, black, ghost, pen, lightning, army, head, cannon, light, skull", we find it almost hopeless. But if we rearrange them like this: "Colonel, army, cannon, noise, thunder, lightning, light, black, ink, pen, hand, head, skull, ghost, terror", it is not hopeless to commit them to memory. If we have to make a number of purchases, try to rearrange them according to the geographical position of the different shops, and mentally go along the various streets, so that we can do all errands in one round. We find the task becomes much easier In remembering the specifications for say a masonry wall-we cannot make a mistake if we take them in the order in which the work is done—quarrying the stone, bringing it to site, dressing it, fitting it in place, etc: We then introduce in the jumble some logical, rational sequence and link the ideas in a manner, in which they always follow, to lead thought along well-worn paths.

241. Value of metaphors and Similies.

Hence the value of all metaphors, and similies. In the Marathi alphabet there are three letters for

"S", and the child is taught to think of one with a tuft of hair on the head, the second with a pierced fat belly and the third that it gets in sugar-cane. Thus is the unfamiliar linked with the familiar in the boy's brain making it much easier to grasp things. A very interesting simile is the one in the Kathopanishad, in which the body is likened to a carriage, the emotions to the horses, the intellect to the driver and the Jiva to the owner of the carriage. Many abstruse subjects can thus be made easy in this way, and every teacher ought to take the greatest advantage of this fact. It must however be always borne in mind that all these are aids to understanding, and the simile ceases to be similar beyond a limit. It must not be stretched to absurd lengths.

242. Use of stories and Parables.

The profoundest truths have similarly been conveyed in the form of parables and stories, which makes them very easy to grasp. The Hitopadesha s a fine treatise on worldly wisdom couched in very simple form, which catches the attention of even children. Æsop's fables are famous. Ancient mythologies are all very interesting reading, in which the laws of life have been very beautifully illustrated, by applying them to human problems. Whether these stories are actual history or not s a minor point. Even in the Hindu literature hey are only known as "Puranas"— old things; nd they ought to be taken as such at least for the reat good they can do. They are all stories with purpose — meant to teach some great lesson, in

an entertaining form, and are certainly more useful than many modern works of fiction, which only take us along the gutters of Paris and New York. These only vividly describe to us the seamy side of life, and appeal to our sensations, without touching the intellect. The others also lead the horses along well-worn paths, and teach the driver at the same time, by arresting his attention and making a deeper impression on his brain.

243. Rhythm and poetry help very greatly.

Rhythm seems to help memory enormously, hence the value of prosody, and versification, Like all rivers, the waters of life also do not seem to flow in a constant steady current, but in rhythmical gusts. When a child first learns to read, it is very difficult to take out the sing-song tone. Why attempt it? Give it poetry and it can follow it quite easily. That is why religious teachings are put in chants. The oft-abused Brahmin has kept up in his head for centuries millions of words of ancient wisdom, all put in verse. To make things doubly sure he strung together every third syllable, the first words of different paragraphs and so on, all again in poetry and that is how he has been able to perform this wonderful feat of memory. Jingling sounds, even if completely devoid of any meaning seem to stick to the brain, and hence the Kârikâs. I learnt years ago that something happens to a set of verbs "shaklu, pacha, mucha, richa etc." What that "something" is, has clean escaped my memory, but I can run out the string of a hundred verbs or so

without a single mistake, partly because of the reverbations whereas I have forgotten all prose rules in Bhandarkar's books. In Sanskrit, they versified even the dictionary and all knowledge worth remembering was put in sutras, "strung' together in a thread.

244 Reasoning

We have seen how our recording angel works, how impressions are made, how they can be deepened, and how we can rearrange them to a certain extent, making the useful ones more pronounced and wiping out those we do not want. A study of these laws—unfortunately not studied in our schools and colleges—is very useful in teaching us "how to study". At the same time it is necessary to consider the why of things. Which furrows should we retain and which should be obliterated and why? That is the business of a second department in the brain. We have observed a certain order in which impressions follow each other in time and space; but if we go a little deeper, we find that amidst all the jumble of innumerable experiences, different events come after each other in a definite and invariable sequence. Even the experience of our shy horse was like this: "Strange tree, memory of pain, (horse stops, driver gets irritated) whips horse, recurring pain." The animal only missed the two stages inside brackets. The links are always there, although we do not often notice them. Apples had always been falling, and the earth had always attracted them. It was only the connection between the two that flashed in

Newton. Our stenographers do not jot down every whisper and pile up record on record without a purpose. They do it to the end, that the second aspect of Intellect should perceive the thread that persistently runs through them. However distorted the vision may appear at first sight, if we look at it carefully, we shall see an Eternal verity behind it. It must be admitted that this is no easy task, and more often than not we do not succeed in our endeavour to see the hand of God or the existence of that Law, if we prefer to put it that way; but all our sages have told us from the house-tops that IT IS SO, and even with our undeveloped and limited intellect, we too cannot help seeing it to a certain extent.

245. Reason—Buddhi, the wise charioteer.

Grooves in our brain which correspond to the inalterable succession in nature are correct, logical and reasonable: all the others are wrong. To search for the former ought to be the aim of our Intellect, because they lead us to happiness. Other ideas bring us into conflict with God's or Nature's laws, and result in pain. We must therefore learn to keep a constant watch on all our experiences, try to wipe out of them those that do not harmonise with the Eternal Verities and deepen the others. That is the real goal of all intellectual education. Mere collecting and recording sensations in an aimless manner is cramming, whether it is poetry or chemical formulae. Rearranging them and storing them in the correct order is not cramming, even if

we read a thousand books. It is foolish t talk of burdening the brain with Eterna Truths. The stomach is oppressed only with undigested food. As soon as it is assimilated i ceases to be a clog and becomes nourishmen instead. So it is with the intellect. Aimles reading even if correctly memorised, brings n happiness. We must learn to pick and choose—t discriminate—to see the golden thread or GOD'S PLAN running through them. That is the functio of Buddhi—Reason—the real goal of Intellect.

XXV—HOW OUR CHARIOT GETS ALONG.

246. The carriage, the horses and the charioteer.

The physical, emotional and intellectual or rational—these three bodies interpenetrate and are very intimately bound up with each other. Each of them have their organs—specilised centres of activity, and life-currents flow through them all with varying intensity. The jiva (Inner man) who appears to be quite separate from, and above all the three garments focusses his attention now in one, now in the other. We have all experienced how sometimes sitting quietly we are so absorbed in some problem, that a friend has to call us ten times, before we "hear" him. At other times we get so beside ourselves with anger, which surges through us so strongly, that we try to do things beyond the capacity of our muscles, or without a thought of the possible consequences ever touching us at that time. We also know how a really good tooth-ache or a splitting head-ache, will blurr the whole world. But all the time, our recording angel has been cooly noting down every impression that came in, and as soon as he gets a chance, he is not slow to tell us "I told you so". He reads out to us how we passed through a similar experience in the past and how that time too we got very angry with the boss and lost the job; or how our teeth are bound to ache if we do not clean them properly. This querulous voice is at first very feeble, and we often do not heed it

We suffer, and he pops up again with his "I told you so". We have seen how the intellect too can form wrong associations and its advice too may land us into a mess; but of the three bodies at least, it appears to be the wisest. At any rate, it is willing to admit its mistakes and to record them as such for future guidance. It is like the charioteer, with emotions as the horses, dragging the physical body the carriage. That is a very good simile as far as similies can go, and clearly brings out the comparative dullness of the physical body, the brute strength of the emotions, and the feebleness of the drivers's body, but the greatness of his brain, by the use of which he controls the horses with a flimsy looking rein.

247. Emotions and food.

Wonderful as is our physical body, it is a poor thing as compared with the emotions, which like the horses can drag the carriage whither they will. The effect of emotions on the physical body is well-known, and yet many doctors of medicine seldom take them into account. Anger stops the flow of saliva, and perhaps increases the secretion of bile. All violent emotions both good and bad quicken circulation of blood, and instances are not unknown of people bursting a blood-vessel under the stress of anger or even joy. Gentle love on the contrary encourages life-processes, and an humble meal amidst harmonious surroundings of a home stands a far better chance of being properly assimilated, than the best dinner in a rushing restaurant. Food is not mere carbon and nitrogen.

Now-a days it is recognised that it contains something else, connected with vitality, and hence known as vitamines. But in addition to these, food can have attached to it emotions as well. When the fond mother packs up sandwiches for her boy, she is literally charging them with her love ; and her son would do well in eating these cold things, in preference to an indifferently served hot meal. That is why we offer *Naivedya*—our food to God, before we eat. It is not that the Almighty, shivering in the clouds as our educated wranglers imagine, needs our rice, but by putting ourselves in that mood of devotion—love for the All-highest—we better regulate our own life-currents, impart to the food some desirable emotion and perhaps much more, when the bread becomes "Christ's Body." Our religions have always said so and one day even the Royal Society will set their seal on it ; but in the meantime why laugh at it ? It cannot at least do any harm. Why not give it a trial ?

248. Emotions and disease.

Physical disease is caused by poisons entering the system, and to the poisons have now been added a host of bacteria, like those of cholera and plague. We have seen how the police in our blood—the white corpuscles—rush to the remotest corners, whence these intruders are reported and try to eat them up. In the meantime the enemy exudes some toxins, and these get into circulation. Our system replies by producing some appropriate anti-toxins which neutralise their effect. So the battle wages till health is restored

or the person dies. All this is no doubt correct; but it is not all. Even in a modern army with all its weapons of destruction we have to recognise a thing called "morale" a wishy-washy vapourous something, which will not go into a test-tube, and yet it seems to decide the issue. So is "vitality" in our body, not what is bottled up in the wonderful patent medicines on the market, which are nothing but some stupid sex-stimulants. The real vitality comes from within—the fourth-dimension, and depends upon our feelings and emotions. Most of the modern diseases originate in shattered nerves, which are only the logical consequence of unregulated and riotous sensations, incessantly coursing through them. These are the "bacili" which attack our nerves. An exciting scene in a cinema leads to lewd longings which, repeatedly indulged in result in selfabuse, and perhaps end in syphilis. Salversan is no doubt a good remedy at the other end, and may be the only means of saving the man's life after he has reached that stage; but the real cure must begin with the mind where the trouble started. And yet our "scientific" superstitions are so great that it would be only a very bold doctor who would dare refer to this aspect, in lecturing on the cure of syphilis. Poisons, and bacteria are all real; antitoxins and serums are also useful: laws of hygiene are all true, and must be obeyed; and yet, a well-regulated and virtuous life is a far more potent shield against disease and pain, than all the patent medicines and inoculations in the world. It affects "vitality"—the "morale" of our Army.

249. Mind-cure

Religion tells us that all diseases begin higher up—with the mind; but, if we think of it, we shall see that at least a great many of them do so. These obviously ought to be curable the same way. We have in the west a set of "Christian scientists", effecting wonderful cures, and the famous Coué has amply demonstrated the same thing. I have personally seen cases where people have thrown away good medicine brought from an M. B. B. S. and taken some sort of a decoction given by one who never entered a medical College, *and got cured.* The first mixture was obtained at a crowded "free" dispensary, where the learned doctor was intent upon quickly getting rid of the numerous patients and the compounder busy with his "baksheesh". The second dose was given by a man, who entered the poor man's hut, pretended to understand the case by feeling his pulse and looking at his tongue, showed his sympathy by patting him on the back, and explained to him how after all only God cured, if He so willed, and man could only help Nature. In another case when a captain I. M. S. after careful examination declared that a child was dying, and it was only a question of few minutes the child recoverd with a few spoonfuls of water, to which a little smell had been added, and which was given and taken with God's name on the lips and perhaps in the heart. If I talked of this in the sacred precincts of the Medical College I would be sent to a mental hospital; and yet

every day people prefer a kindly-hearted sympathetic, human hospital-assistant or even a quack, to an M. D., D. P. H., D. T. M., F. R. C. S. sent out by the College, after thoroughly disinfecting him of all undesirable germs, like God, good wishes, and blessings. In the olden days they insisted that only a virtuous person with a kindly and sympathetic heart could be a worthy doctor, and with every dose people were taught to repeat "Ganges water is the medicine and God the only physician" at least with their lips, and the cure depended upon how far they felt it.

250. Control of emotions.

We have seen that the physical body which justly excites our admiration is but a cleverly-carved clay cart. If we once accept the fact that all diseases orginate higher up, it would be comparatively easy to get rid of all physical misery in the world, but we are unable to achieve that end because it means controlling our emotions, which is a far more difficult proposition. The simile of the horse is so good that it not only describes the problem but points to a solution as well. One way of checking the horse is to tie up the carriage, or put a hard brake on it, to put some obstacles between the horse's feet, or to chain them up. People learn concentration by holding their hand at right angles to the body, or sitting in front of a smoky fire, or sleeping on pointed spikes, for days and months. With the telephones reporting constant irritation and pain, it is of course not possible to have any bad emotions. Instead of

drowning our sorrow in whisky, which makes the horses temporarily unconscious, we might attempt the same end by going to a very bad dentist and having a tooth pulled out. All these would be quite brave and need some doing. That is why such feats are very fascinating. They do strengthen the will and if carried out in the milder forms, and only for a very short time, such practices might prove really beneficial, but they always have a tendency to harden a man to all emotions good and bad alike—and to make him self-centered. All that the horses can do is to turn the carriage round and round, and that affects their health. The horses get so effectively "broken", that they are entirely "broke" and famished. With such horses how can we get on with the journey? The first thing to remember therefore is that we do not want to kill the horses, but to control them. The more vigourous and sprightly they are, the better for us, the more useful shall we be. The surgeon must be able to feel the pain of his patient, as if he was cutting his own stomach, and yet he must not allow that to blind his vision, or to make him change one stitch by a hair's-breadth. "Powerful emotions—strong horses, and yet perfectly obedient to a touch of the rein"—that ought to be our goal.

251. Wait a minute and count ten.

Whenever the horses feel jumpy, pat them on the neck, tell them we are going, and fast, *only after a minute.* Horses soon understand it, and actually enjoy a little frisking in anticipation.

With part of the charge thus allowed to leak out, they are much more amenable. While the horses are thus enjoying the run in their imagination, the driver should carefully look ahead and see how many paths open out before him. All roads are generally winding, and like Goldsmith's good natured man, we very often go round and round the same spot. For getting out of a Bhulbhulaya, a maze, we must follow some principle, some law of nature, some Eternal verity, which the Intellect should have perceived. At any rate, we can try to examine the tracks that lie in front of us, as far as we can, by mentally going to the logical conclusion of everything. Suppose I get angry with something another man says or does to me. I strongly feel like beating him. Wait—count ten. Is the other man stronger? Yes. Is he also short-tempered? Yes. Very likely then he will give me a sound thrashing himself, and is only waiting for a pretext. No. he is a weakling. But he may complain to my father, who has a long hand. He may even go to court and I may be fined, and punished at home again. These are all the possibilities. But perhaps my intellect will tell me at the same time that this fellow has been maligning people too much, and in his own interests needs to be taught a lesson. I can at least try to do a good thing, and, if necessary I am prepared to suffer for it. If after calm consideration I come to this conclusion, then my obvious duty is to give the horses rein, and go ahead in that way. Time will show whether I was wise or not; and my recording angel will make a note of it, for future guidance. Experience is

the only effective teacher; but that is the charioteer's business. The horses have done their duty and in as much as they waited till we "gargled our mouth with salt water", we have proved our superiority over them.

252. Give the horses a little rein.

If we are going south and the driver makes up his mind to go due north, it would be foolish of him to try to turn the horses right about. Every one of us is moving with a great deal of momentum, in a certain direction, depending upon our past. Newton tells us that it would require an enormous force to make us redouble our course; and if we are not sufficiently elastic, we may get crushed by the impact. But even a small knock acting at right angles, and constantly repeated will in time make the body turn in a curve right round, without losing even an ounce of the original momentum, which is nothing but inertia, habit, emotion. So even after we intellectually recognise that we have to turn right round, it is wiser to give the horses a little rein. By imperceptibly but constantly pulling them to the right we will reach our goal much quicker. The way to replace competition by co-operation does not lie in killing the former, but by introducing the second element in every competition. The boy plays, and does his best, but only as a member of a team. He plays for the school, not to win a prize for himself. A boy who likes to stick thorns in butterflies is made a surgeon, and a boy who insists on opening his father's watch is sent to

the workshop. People who like power can make very good policemen, and in the present state of society even a man who likes to kill has ample scope for it, in the army, where he can kill, not for himself but for his country.

253. The drink problem, as an example.

Barring a few doctors who maintain that moderate drinking improves health, we can take it that a majority of mankind accept that alcohol is an evil, which we should get rid of. How to do it, is a problem which has taxed the ingenuity of mankind. We have at one end complete prohibition as in America, with its boot-leggers and speak-easies. However exaggerated the reports of its failure may be, no prohibition can possibly take away the desire to drink; and in fact all "don'ts" increase desire as we have seen before. When the demand is there, it is quite probable that the supply will come and does come. A man is not going to stop drinking merely because we ask him to pay four annas, instead of three. The policy of reducing the percentage of alcohol in country liquor followed in Bombay, has only led to greater consumption of foreign wines, which are going as strong as ever. Picketing by boys or even ladies can never convince people that they ought not to drink. If they do stop for a time, it is only out of respect for the great Man in whose name they are asked to abstain. They keep away only as long as the wave of enthusiam lasts, and the victims do make up for lost time. A more lasting remedy is to *substitute* for drink, something less harmful

—a cup that cheers but not inebriates ; and this was tried in England during the great war with great success.

254. The Carlisle experiment.

In 1915 a new munition centre was opened at Carlisle, which meant an addition of 15,000 to the population of the place, which was then 56,000. Lodging houses became packed, men slept on staircases and beds were let, on a three-shift system. With no home-life it was inevitable that men should flock to public houses. In war days money was no consideration, and the munition workers with their pockets jingling with coin felt like painting Carlisle red on Saturday nights It was not long before scenes of drunkenness and disorder called for desperate measures. What did they do ?

All public houses were at once acquired by the State and their number gradually reduced from 119 to 65. Food was provided in every place. The staff was the same, and well paid, but they got no tips on drinks, but were paid a commission on the value of food sold. For a drink every man had to cross over to the bar and pay cash. Food was served at the table. Fireplaces were provided where a man could come and warm himself for an hour, and leave without taking a penny-worth, and no questions asked. No waiter was to ask "what will you have", on pain of dismissal. Gramophones, even billiard tables were put in for the customers; so people often came in to booze, and forgot all about it in a game. In some shops a piano was added and in others were

arranged regular concerts, and lectures on interesting subjects. Thus were the shops converted into free and comfortable club-rooms for the poor. Convictions which had increased from the pre-war 250 to 953 fell down to 320 in a few months, and are now (the system still continues) nearer a hundred. "The brute was sobered"; and what is surprising, at a profit to the State. The total amount invested in the enterprise was £. 922,061, all of which had been returned to the State and during 1926-27, the scheme brought in a profit of £. 89,422. That is a very interesting illustration of what can be achieved by "giving the horses a little rein.".

255. Little vows.

Another method recommended by all religions is the one of keeping little vows. They may or may not procure for us a seat in heaven, but they do help us to gain control over our appetities and emotions. The horses naturally do not like these restrictions, with which the old books try to hedge us in from all sides, and that is one of the main reasons, why the modern man hates Religion itself. Many would not mind a God sitting high in the clouds, but if he is going to order me not to eat nice things, well, that is another matter. But from our own point of view these little restraints are very valuable. Do not eat every Friday, or on the eleventh. Leave tea for a week every three months. Do not take sugar for six months. Do not touch the dish you like most for one year. No smoking at night and no alcohol

during the day at least for some time. No cinema till so many problems have been solved; and so on. The thing to be done may be very trivial, and yet, if we do it without fail, we have obtained better mastery over our horses. The thing to remember again is that our object is neither to kill them nor to torture the flesh, and so nothing which will do the slightest permanent injury to the body should ever be attempted. We pull up the horses just for a second to see if they will obey us. It is like stopping the train on a down grade to make sure that the brakes are in working order. That is all. The carriage, horses and the charioteer thus interact on one another: the driver daily gets wiser, the horses more amenable to control and we get along our journey, with greater safety and faster if we have not been foolish enough to kill the emctions or cripple our body.

XXVI. BEYOND THE INTELLECT.

256. The average man of to-day.

A great many people in this world are born in unhealthy surroundings, or they get diseases later; and these have to spend most of their time in attending to their physical body. Many others spend half their life in combing their hair, and looking at their wonderful features. At death the dust on which they doted so much returns unto dust, and all their labour seems lost. A very large majority however live in their sensations and emotions. "Eat, drink and be merry" is their motto. They seek pleasure through the senses. They get a cake to tickle their palate, or some strong wine to make their horses prance a bit. They put their body to rest amidst soft cushions and take their emotions on a riotous round with the hero or heroine of a modern novel or follow their doings better on the screen or in a talkie. They even visit scenes of cruelty like bull-fights, which strangely enough they enjoy from their safe seats. Others have realised that the carriage and horses are after all unimportant. They will go wherever their driver will take them; and so they concentrate on the coach-man. They have learnt that by scrupulously following the rule of the road and "keeping left", they can drive faster and with less danger of coming into conflict with others. They discover that by being temperate they can drink the maximum quantity

of wine in a life-time. They too give their horses a little run now and then; but they certainly differ from the people whose horses are giving them a run. The intellectuals have a certain control over their emotions; and such persons generally get on much better, and perhaps their happiness lasts longer than the others. But even they soon see that the body is after all a vehicle and the horses get tired much sooner than the charioteer. The pleasures of the senses pall and the driver has to sleep off the interval, till the horses are ready again. That is the present state of Mankind as a whole.

257. A Rationalist.

A few of these having seen the Laws of nature and the invariable sequence of events in life, come to the conclusion that the emotions do not matter. Their coachman—the all-wise and infallible charioteer feels confident to pronounce judgments and lay down a course of conduct. The dictates of intellect are of course the best guide available so far, and it is perfectly right and proper that a man should follow these; but that is not as simple as many people imagine. Any one can become a member of the Rationalists' Association, by paying a fee and signing a perfectly rational pledge. But keeping that vow which implies not yielding an inch to the horses, is not so easy. We have already seen how all our impressions are coloured by our individual experiences and how very difficult it is to extricate out of them the Eternal verities. Even these depend upon our point of view. The same woman is looked upon as a wife by her husband, as a

mother by her children, as a sister by her brothers, and only a daughter by her parents ; and even a Rationalist can not forget these distinctions in laying down the law for people. Even if he does not attach the slightest value to his personal feelings or believes that he does so, it would not be "rational" for him to ignore the fact that a majority in the world do so. If our enthusiastic Rationalists were not so recklessly indifferent to the feelings and emotions of people whom they want to convert to their (very right) views, they would get on much faster, because they would be proving by their conduct that the reign of reason was desirable.

258. The coachman discovers a passenger.

Sensualist or rationalist, a day comes to every man, when his senses are tired and his intellect has seen as far as it can, he feels convinced that it is stupid to talk of the world as a fortuitous concourse of atoms. In spite of many gaps which are difficult to fill, the intellect cannot help sensing some method in Nature's madness—some plan behind the apparent struggle for existence. The more really Rational a man is, the quicker this happens. It dawns on him that Nature inspite of looking red in tooth and claw and cholera, is an ordered whole and he begins to wonder if he has to play any part in the drama besides looking after his carriage and horses, which every beast tries to do. "Why all this bother? Whence did I come? Whither am I going? Why am I surrounded by millions of other carriages?" These questions gradually

become so insistent that he leaves off scanning the horizon for a moment. He glances within, and to his dismay, finds for the first time that he is not alone. He has a passenger reclining comfortably in the coach, who to all intents and purposes behaves as if he was the owner of the carriage.

259. Is he the owner ?

In addition to the function of collecting as *chitta*, and reasoning as *Buddhi*, and having successfully taken the carriage through many a tight corner, and run a great many races safely, the intellect naturally develops a little pride—*ahankara*. It cannot meekly submit to the occupant of the car, but his calm dignity is rather baffling. The intellect tries to argue as is its wont; he only smiles. The intellect gets vehement; he only shrugs his shoulders and settles down to read. A man is walking along a road. He wants to go somewhere urgently. As far as his senses report, the foot-path is perfectly clear of all obstacles. The intellect can see no earthly reason why he should not walk along. Suddenly the passenger tells the coachman to "stop". The imperious command having been heard by the horses as well, they stop before the driver has had time to start his dispute. And lo ! with a tremendous thud the wall to the left crashes down on the pavement. If that "booby" in the carriage had not interefered in time the man, carriage, horses and all, would have been buried under the debris. Even the horses have found out that

the voice which saved them, came not from their swaggering proud driver, but from some one with a silvery ring in his speech. The coach-man feels a bit humbled. Perhaps the Inner man is wiser than the charioteer. Perhaps He is the owner of the whole outfit, of whom some "cranks" have been speaking all these ages. His is the voice of Intuition, the Inner voice of Mahatma Gandhi, the Demon of Socrates, the Angel who dictated the Koran to Lord Mahomed, the Flute of Lord Krishna.

260. The Inner Man essentially for Unity.

Such experiences are not so rare as people imagine, nor are they reserved for the select and elect few. Any one who has his senses under fair control, and whose intellect is not warped by too much pride can hear his Inner voice at times, perhaps when he least expects it. It is only the sensualist—whose horses are too jumpy, and the so-called rationalist, who has developed the third aspect of intellect too much, who find this difficult. The Inner man does not demand that all emotions be killed, or that the intellect be silenced. His dictates are no more irrational than those of our Reason. Only he argues from his own experience, his own knowledge, his own conviction which naturally form his own premises, *viz.*, that all these billions of carriages belong to ONE household, to ONE OWNER, who has made them for the amusement of his children. To the Jiva this is not a wishy-washy hypothesis with which the

intellect tries to comfort itself, but an absolute fact, which needs no argument. His attitude towards life is necessarily synthetic; it tends to unity. He cannot countenance any separatist tendency on the part of the horses or the charioteer. As long as the horses "keep to the left," go along the path of love, he has no objection to their rambling amidst all the winding by-ways. He rather enjoys such a drive because the other carriages are also occupied by his own brothers. Like wise owners he does not like his driver to run foolish races with others because he knows that in such cases the horses often get out of control, and come to grief. He wants his charioteer, to look for opportunities to help other drivers, to cooperate with them, not to compete with them. That is all. As he has to travel he does need the outfit, and prefers a crack one. But naturally he cannot relish the horses getting him into a pit, or his driver quarelling with his brother's coachman.

261. The jiva's Eternal Home.

Why has the jiva at all undertaken this travel we shall try to inquire later, but if we believe tradition which has been handed down to us, he does not seem to relish it much, at least in the beginning. Perhaps he acquires a taste for it later. Whatever life he leads in His home, it seems to be far more delightful than what the best of us can have. We have "heard" it said (in the Shrutis) "Take an optimistic, determined and virile young man. Give him the whole earth with all its

wealth. That would be the measure of the highest human happiness. Make that a hundredfold, and again a hundredfold and so on and on hundred times. That would give an idea of the joys of those who live in the highest spheres, and of that ONE who has conquered all desire." Supreme ecstacy—Ananda—is one of the three essential attributes of that region, and has to be a characteristic of this earth as well. Asking the Devas to go down to this earth of ours is like sentencing them to penal servitude and is looked upon by them as the greatest curse. It appears that a whole host of jivas once created by the Lord, in order to send them down, rebelled at the instigation of Nârada and refused to come down to this muddy globe, for which offence Nârada has been condemned to eternal wandering amidst this choking dust. Whatever these mythological stories really mean, they all imply that the jiva's life in his own home is very much pleasanter, than the one he can lead in his travels, which he undertakes very unwillingly. This is the best description we can get, and every attempt at being more explicit is met with the following replies :—" The intellect cannot grasp it. One can only talk of IT in negatives. It is not like anything we know of." Swetaketu pressed further and was told " Thou Art That, Swetaketu" an expression wholly unintelligible to us, except that it connotes ONENESS—undivided UNITY

XXVII. THE GREAT FUN.

262. The outward journey.

The Inner man is fully conscious of the unity, and so to Him it is all great Fun. there is no struggle, no suffering, but only the awkwardness of having to manage a clumsy coach. He knows that after all his horses are brutes and the charioteer but an uneducated or half-baked person, and so He does not expect too much of either. The mere fact that he wishes to drive in a separate carriage of his own means a separatist tendency to that extent. Creation began with diversity, and the whole trouble is to see the Unity in this diversity. What does the poor ignorant coachman know of the august Father, whose children, all the jivas are? So like a wise owner he is very patient with the coach-man. Whenever he goes out he has his carriage attached to those of two more persons, his father and mother, whose drivers advise and help his own coachman. Later on, when he leaves their company he takes on a wife or a husband and then children and in his turn gets his man to help their drivers. Then again all the charioteers living in a certain area, a town, a district or a Nation, meet together and try to lay down some rules for all. While all the horses and coachmen are thus learning from each other, the owner takes it very good humouredly. If a carriage breaks up by wear and tear or is shattered in a collision

he rides the horses, with his syce for a while until the horses drop dead. He knows that the coachman after the mishap, will be more amenable to reason and so walks with him a bit, explaining to him how to avoid the trouble next time. He asks him to select better horses and a new carriage and goes on his journey again and again in a similar manner. All the time the jiva seems to be preoccupied with some work of his own of which the intellect can form no idea, nor does it appear to be the coachman's business. The owner allows him quite a free hand as far as the travelling arrangements are concerned, even feeling amused at his occasional arrogance. It is only when the horses are fairly steady and the intellect has learnt to look for his guidance, that the Inner man begins to take greater interest in the journey.

263. Homeward bound.

Once the jiva takes the direction of the tour in his hands, things entirely change, because He is always conscious of the essential unity of creation, and knows why he is out. The first part of the expedition is called the outward path—*Pravritti Marga* and now starts the return journey—*Nivritti Marga*. Not that the coachman is now fully obedient, but he is now much more tractable. The process of getting absolute mastery over the body, emotions and intellect means a hard struggle ; but it has its own compensation. Instead of rushing along at break-neck speed, the man begins to seek seclusion, at least

for some time every day; as it were, he gets on to a maidân to exercise his horses by himself. He had been worrying his head so far that he was not a king. He now sits calmly, and tries to be in imagination a king—a kaiser, a czar, or a Duryodhana the mighty emperor of old. He goes to the logical conclusion of the czar's life, and kingship loses all its charm, for him. Even the good kings Dharma and Rama were not exempt from suffering; and after all how long did they rule? He then begins to realise that the pleasures of this world are but fleeting. They turn to dust and ashes in the mouth—they are impermanent. Then the intellect suggests: "Why not imagine yourself to be a king and refuse to die"? That is a very good solution—these are the delights of Swarga, paradise. They last comparitively longer, but they lack the solidity, the momentum which earthly joys have. And *even they* pall. This discrimination between the short-lived and the enduring, at first leads to a disgust (*Vairagya*) and a longing to have done with the whole show, (*Mumukshatva*) to get liberated—to go home. He therefore begins to train his horses more vigorously.

264. The jiva is "at home" everywhere.

But a little calm consideration brings home to him the fact that he has already wandered far from home. He is thickly surrounded by millions of carriages all moving hither and thither. They are not yet disgusted with their life on wheels. How can he ignore them all? Even if he retires to a

forest, they are all sending him their thoughts. He cannot help their cries of pain reaching his ears, any more than he could keep out the hooting of the motor horn when he was himself on the road. The coachman now having heard of the glories of the Master's House wants to go home, but the jiva cannot forget that after all those who are struggling, and suffering are his own brothers. Why not take them all home so that they can have a grand family gathering? After a little hesitation the charioteer also falls in with the idea and swears allegiance anew. They all go about pointing out to the other drivers the great advantage of going home, or at least of scrupulously following the traffic regulations—the Law by which traffic is held together—*Dharma*—Religion (both words come from the same root). They go on shouting, asking, pleading, entreating people to kindly "keep to the left". Of course, they never break the Law; the horses are under perfect control, and the coachman perfectly wide awake and vigilant. They see the fleeting nature of the world equally well, but out of love for the fellow brethren disgust has now given way to dispassionateness—true *Vairagya*. The desire for personal liberation now means liberating the Inner man from the disabilities imposed upon him by the disobedient driver, unruly horses, and the rickety carriage—true *Mumukshatva*—better translated LOVE. The man now does not want to "go home". He is "at home" wherever he is.

265. He accepts an office.

All this time the Father of all the jivas, called Shiva who created the whole world for the amusement, and instruction of His children has not been idle in the clouds, as some people complain. He laid down all the Laws of Nature and He sees that they are all invariably followed, perhaps through the agency of a set of officers, known in our religions as angels or *Devas*, the shining ones. He knows that experience is the only effective teacher, and so He allows all his children to wander about freely. They break their carriages. He patiently mends them, or gives them new ones. The horses die. He gives them the choice of others. He contiuually broadcasts the rules of the game, though the children do not heed them, as the jivas are in the beginning sleepy and preoccupied and later engaged in teaching their drivers. In the case of the jiva who is "at home" everywhere, the struggle is over, and He now has time to play with his wireless receiver. He does not need to listen to the rules of the game, and so on turning the knob He discovers that the Father wishes for His help. So instead of merely going along persuading people round about him at random, He now studies His Father's Plan and does the work assigned to Him. He accepts an office in His Father's household.

266. The Inner government of the world.

We are told that the Father Himself only watches the whole fun, and the actual administration is in the hands of these Elder sons. Far

from being a fortuitous concourse, it is perfectly systematised. At the head are the trinity of chief ministers corresponding to the Priest, the King and the General—the Teacher, the Ruler and the Manager. The king coordinates all activities and exercises general supervision over the whole evolutionary process, *en masse*. He is given Archetypes by the father, and he tries to mould the different races after them, guides them to their respective homes, allows them to set up kingdoms and empires and breaks them up when the time has come to pass on to the next lesson. So under His eye humanity has now evolved a fairly good physical body, our emotions are well-developed and our intelligence is being sharpened. Its third aspect—pride of individuality is beginning to function effectively and hence the present day troubles. These are all very essential and necessary. When we take the next step and develop our Intuition and sense Unity, the diversity will lead it additional charm. That is perhaps the purpose of the whole thing. The second Minister the Teacher explains to all, the rules of the game, working from one end as Science and the other one as Religion, and expounds how everything is governed by the Eternal Law, of which Newtons Laws are only an interpretation suited to three dimensions. The Third Chief Minister looks after the details in his various departments.—Applied Science and Art, physical and superphysical, as in various ceremonies, and sublimation of Emotions. These mighty Ministers have their Leiutenants, and a whole staff of permanent officials, and seven departmental

heads—known as Devas or Angels. Many of these do their work from the central offices, but a very large number only ride, like our mounted police, because that gives them greater mobility in directing the whole traffic. They seldom, if at all, travel in carriages, and that is why we do not meet them in our daily life. Some of these subordinate officials coach-builders, carriage-repairers, grooms, traffic police, etc: do make mistakes occasionally as happened in Mandavyâs case, but with wireles, and television fully developed, all these are detected at once and righted. Such is the Inner Government of the world, which maintains perfect Law and order, and thus secures to the citizens the maximum liberty. It is only in the exercise of this freedom, and in learning to use it well, that man bungles so much—we have famines, devastation and wars; and this naturally raises grave doubts in our minds as to whether all these are not mere fibs of our imagination or bablings of a child humanity. But our sages have told us from times immemorial, that THE INNER GOVERNMENT EXISTS, AND ITS LAWS ARE NEVER BROKEN.

267. Our outer Governments.

In fact all our constitutions are all modelled after the Inner government, and are our crude attempts at copying them. We fail so often and so miserably and that is why we find it so difficult to believe in the very existence of a well-ordered Universe. Why is it that we all go wrong, when the Inner government is said to succeed ?

Have we not seen that amongst them no one is invited to fill an office, until He has his body, emotions and intellect under absolute control, and to whom the Unity of Life is not a theory, but an indisputable fact. To such an officer any two fighting persons are like two fingers of his own body. How can he be partial to one of them? He knows that the two jivas his younger brothers do not want to quarrel. Their foolish horses have got entangled, and the coachmen have got out of hand and are wrangling and blaming each other for the accident. He will help the boys to samjao their drivers; but if they are too excited, He gets his brothers to leave the carriage and go home. His Father's policemen will at once clear the crowd, and empty carriages are not allowed to loiter. One Law of the Universe is that a turn-out discarded by one son is never engaged by another, and so the horses die for want of food and the coachmen, now repentant, go back to their respective masters, who in the meanwhile have been resting in the Father's mansion. That is the way the Inner government regulate their traffic. All the time its officers are entirely *above* the whole thing. Our outer governments are run by clever coachmen, and even horses have seats in our Parliaments. Is it surprising that we fail? How can people whose own emotions run riot, lay down the law for the control of emotions? It is futile to expect representatives of Mahomedans and non-Mahomedans to compose their differences. Only persons like Guru Nanāk who after serious thought came to

the conclusion that " There is no Hindu and no Musalman," can do that. Emotions govern the body. Intellect can control emotions. Intuition with its spirit of Unity alone will curb the intellect, and get the best of it. That is why the old sages asked a king to subdue himself, before conquering others. We do not succeed because we do not keep this in mind.

268. Why all this bother ?

Amidst all this hubbub we often ask " why all this bother ? "Can we not end it ?" Sometimes some of us even attempt it by committing suicide ; but presumably that solution—which is the logical outcome of materialism—appeals to very few, and only when misery has deranged their minds. A little thought will convince us that we ask these questions only when we have bumped our head against some hard thing. We have all the time a subconscious feeling that there is a great God leading a very delightful existence somewhere in the clouds while poor "me" is suffering here, and so we ask "why did God create this world ?" Is God responsible for our pain ? All that He has done is to lay down certain definite Laws which cannot be broken with impunity. There are Laws for the physical world, and how often do we ignore them in our eating and drinking and come to grief ? There are similar Laws which govern the Emotions and the Intellect—known as Laws of Morality and Science. If we disregard them we suffer, and who knows everytime we have pain our Father in heaven does

not feel it more acutely? Only knowing that it is only transitory He does not take it too seriously. Our Father has written out a beautiful story and he wants his sons to put on garments of matter and stage the play so that we may all enjoy it more. In our eternal home matter is like wool, a ball of which will not go far, however much you may exert. A strong man would prefer a tennis or even a cricket ball. The gross earthly dust being heavier, gives greater momentum and intensifies the joy a hundredfold. That is why He created this earth, and wants us to come here. We do not like it. It is a bother, our costumes are so clumsy, but our Father knows that when each one of us has learnt his role, and when plays his part perfectly, we shall all be very very happy. That is why the individual problem is the world problem, and we must take heed of the ancient advice" Man, know thyself". When we have all done this thoroughly we shall never ask: "why bother", and be really thankful to our Father for it perchance to leave Him, to found a new theatrical troupe of our own on some other speck of dust and enjoy the fun once again.

XXVII. IS IT ALL AN ILLUSION ?

269. Diversity a delusion.

We have seen that the whole problem of Evolution set before us is to realise *Unity in the Diversity*, because we are told that the Unity is a fact, nay, our sages go further and proclaim that that ONE alone exists. Everything else is a delusion. They point out that to a jaundiced eye the whole world is yellow; and a large building appears as a speck from a distance, and again grows in size, if looked at through a glass. To one sailing in a boat everything appears to be in motion, and on a cloudy night, it is the moon which seems to move amidst steady clouds. And yet we all know that the world was not yellow, the building never changed its size, the trees did not move, and the moon was steady and not the clouds. The wise men of old tell us that the whole diversity is a similar delusion. As on a dusky eve we may mistake a coil of rope for a serpent, and be actually frightened of it, or even try to run away from it, so do we react to the phenomena we see. All that happens in space and time, all our Laws of causation exist simply till we realise that the serpent is only a coil of rope. After that I suppose we have a good laugh at ourselves: and then nothing exists except ONE —of which no description in words is possible, except that it is Intense Bliss. There is no future, no past, but an Eternal Now.

270. Is it so absurd ?

All this sounds so much nonsense to our ears; and yet any earnest inquirer cannot help being struck by the ring of sincerity pervading all these teachings. These Teachers do not appear like propounding a theory, or trying to reconcile some little discrepancy with an old hypothesis, as do our twentieth century scientists. On the contrary they laugh at such persons "who consider themselves staid and learned and go about deluded with a faltering step, blind leading the blind". These are strong words, and a "Twentieth century Doctor of Science" with all the poison gases he has invented, might with justice feel aggrieved at them. But a seeker after Truth cannot afford to take offence; he has got to account for every phenomenon, including this rebuke. Perhaps after all the kindly Elders do not mean to insult our intelligence. If they do, why should have taken all the pains to write so many books themselves to explain to us, how to overcome this illusion, the existence of which, they never deny. They know that while it exists, it is intensely real, like the tiger in the dream. They only want to wake us up. Theirs is only brotherly banter to goad us on to greater efforts. In their eyes we are but children, and did not one of the biggest of us consider himself as a boy playing on the sea-shore, and diverting himself now and then finding a smoother pebble or a prettier shell than ordinary, whilst the greater ocean of Truth lay all undisturbed We get our doctorates only by describing the appearance of a portion of this

pebble, and perhaps the same boy Newton who has been wading through the water a bit, in the body known as Einstein, has drawn our attention to a wonderful jelly-fish, which now evokes the admiration of the whole world. This new discovery is taking us fast to the assertions of our Savants. Instead of swearing by Newton's pebbles therefore, it behoves us at least to inquire, if it is all really so absurd.

271. Space and Time—the old view.

We have already seen that all our knowledge of the phenomenal Universe is derived through our five senses, and we are not aware of anything, which they have not reported. Our eyes show us objects in front of us. Some of them occupy more room in our picture than others ; they extend in what we call *space*. If we look at the objects steadily we see further that they either change their relative positions, or their very nature alters if we give them sufficient something, which we call *Time*. We wanted to be exact in recording our sensations, and so we agreed to measure all extension in space by a certain standard of length, and time by another convenient unit. Our physicists devised for us instruments, with which we could make very accurate estimates of both, but "estimates" only, correct within certain limits. All matter was composed of atoms, and they had definite dimensions of their own: extension in space was a property of matter and this had nothing whatever to do with time. This was self-evident, and required no proof. Was it not on that hypothesis, that the

West had succeeded in discovering enormous sources of Power in coal and oil, by the wielding of which they obtained mastery over the whole world? Everything in the Universe was a machine and could be explained in terms of fly-wheels and belting. Space and time were quite distinct, and ruled the world jointly like two brothers, but each one could be conceived of as a separate entity. Of these Space had succumbed to Man's foot-rule and Time danced with his second's pendulum.

272. Space and Time after Einstein.

But one day the indivisible atom on which they had banked for a century burst into fragments by the discovery of Radium, shaking the very foundations of the mechanical theory of the Universe. Einstein completed the rout by pointing out that every measurement involved "from and to" and these words meant motion, which was impossible without time. "How can any distance be measured without the observer moving his eye from one end to the other" he asked; and "what if the observer himself moved in the meantime?" Two events happening on the Sun at an interval of exactly one minute according to the watch of the scientist on the Sun, would appear to occur at a different interval to an observer on a planet moving towards the Sun, with a velocity comparable to that of light. And so Time can become Space. Time exists only because of our inability to see everything simultaneously. It is a limitation of our consciousness, not a property of the world:

and once we accept that Time and Space are convertible terms, we have to admit that it is possible to reduce Time to zero. There would then be no past and no future, all an Eternal Now—for a Consciousness suitably modified.

273. Can consciousness have degrees ?

Can consciousness be modified ? Can it have degrees ? That would be a very reasonable question. Let us see, if there is any evidence to show that it can be limited and can expand. We know that everything living differs from the non-living, by being endowed with some peculiar properties. In the tiniest bit of living protoplasm chemical combinations and decompositions are effected more extensive in range than any which a chemist can cause to occur in his laboratory. The little cell grows and multiplies by fission. What is more to the point, it is conscious: it responds to stimuli. As soon as it comes in contact with a foreign body it protrudes portions to enclose the particle. So much of it as is digestable is digested ; the remainder is extruded. The amœba is conscious, but only of what comes in immediate contact with it and that too very dimly. It may try to eat up another amœba which it itself threw off a moment before. It shows irritation, which might amount to sensation, a certain choosing between the pleasurable and the painful, but no memory. To it, the whole Universe with the exception of the speck in contact, simply does not exist. It is as it were moving along one line in Space, the rest of the

world having only a potential existence, which it might contact with in Time. It is conscious of only one dimension in Space, everything else being Time. We might call it a one-dimensional creature. The Universe it lives in is by no means one-dimensional. It is the animalcule's consciousness that is so limited.

274. Higher Animals.

Let us now take some of the higher forms of life, which have developed special organs like eyes, and ears, and which show memory. These have complicated bodies including a very large number of animalcules. The chemical changes go on as before. The body grows. The animal reproduces itself. Its sensations are more defined. It feels pleasure and pain more acutely, and *remembers it.* It responds to external stimuli but these are now greatly mixed up with its own memory. We saw before how in the horse's head an association was formed between the strange tree and the beating received. Our child in the earlier stages was no better, in confounding the mother with hunger. Thus animals can do, or can be trained to do various things. Spiders have been known to put in some extra threads running in a direction opposite to that of the prevailing wind. Rats and mice will learn to find their way to the centre of a labyrinth, without taking a single wrong turn. Birds have been seen to collect together in a garden for feeding exactly at quarter to ten every day, even after "Summer time" had begun, and the hands of the clock had been put forward an

hour. Monkeys will pile up boxes to get at a banana hanging from the roof. A dog was trained to go to the station for a paper every morning on week-days, but on Sundays it would flatly refuse to obey. An elephant was taught to take pennies from visitors, to put them one by one in the proper place in a slot-machine and to take out and eat the chocolates that came out.

275. Sensation and perception.

A number of such instances are on record; but there is no reason to suppose that they show any reasoning power behind it. Most of these intelligent things have been proved to be results of accidental discoveries, which are no doubt recorded for future guidance. Rats and mice will forget the labyrinth after some days. The birds obviously followed the usual work of the garden such as sweeping leaves etc., which went on exactly the same before and after the clock was advanced and formed an association with the approaching visit of their hospitable friends who brought them grain every day. The dog saw that the Sunday routine was different and adjusted itself to it. The elephant learnt that it could eat chocolates only that way and so on. In all cases there is no doubt a feeling of pleasure and pain, and along with it, is recorded a perception of what brings that pleasure and pain. That is animal psychology and all animal trainers take advantage of it. They begin by starving a lion and then giving him a morsel of food immediately after he jumps across a table or does something else, they

want him to do. All this is a laborious process and takes time depending upon the creature's memory. But once a link is formed between the trick and the food, the lion or monkey will willingly jump ten times, if necessary, and earn what gives it pleasure.

276. Animals have no concepts and no language.

Animals thus have sensation and perception, which includes memory but each one of their perceptions and experiences stands by itself. They can put two things side by side; and can understand which of the two will give them greater pleasure; but they cannot place two perceptions, side by side. Given material, a monkey will try a number of experiments with it and find out what is profitable; but it cannot experiment with "pictures in its head." It has definite emotions like anger, fear and even love, and it also has different sounds for expressing these. Animals can and do communicate with each other; but they convey only sensations, emotions or warnings. They cannot think. They cannot generalise from the particular; and they are unable to compare and synthesise ideas. Just as we cannot drive a tunnel through sand, without at the same time lining it with brick, thought cannot proceed without lānguage which in its true sense animals do not possess. All sounds produced by them are "exclamations"; and they cannot form a sentence with these. They have no concepts; because even a rudimentary conception is impossible without language, as

Prof. MaxMuller has shown. As he puts it: "By no effort of the understanding, by no stretch of imagination, can I explain to myself how language could have grown out of anything which animals possess, even if we granted them millions of years for that purpose."† It is not a question of mere degree. It involves a consciousness of an altogether different order.

In saying all this, I mean no disrespect to the poor dumb creatures. I only wish to point out the enormous limitations under which consciousness works in them. Do we not see how human babies work in a similar manner until their apparatus begins to function properly? We know how they cry and howl and how they confound hunger and mother. They begin to think, only when they laboriously form their first sentence. Deprived of language, man can do no better than other animals; and Akbar proved this, by shutting up twenty sucklings in a house, surrounded by servants, to whom speaking one word of any language within their hearing meant death.* After four years of such treatment all of them without exception were found to be dumb-mute idiots. But in all such cases, the defect lies in the apparatus not with the consciousness, and dumb-mutes can develop the power of thinking to a certain extent after they learn lip-language. But even then it is well-known how they can never compete with the blind, who have the full use of speech.

† Science os Thought by Prof. Max Muller (1888)

* History of India, by Elliot and Dawson 1873, Vol. V Page 533.

277. Nothing solid without "conceptions".

Our eyes which report to us the existence of the outside world throw on our retina only a flat picture of it. However near we may be we can never see a table or a chair as it is. We see only a very distorted flat image of it and no more. The impressions from the two eyes, combined with the reports from the sense of touch from our hands, enable us to "think" of a table. Blind men get an idea of solidity with their hands; and it is on record that to a blind man restored to sight, all distant objects which he had never handled appeared quite flat and it took him a long time before he could "think them into solids". It is Man's power of forming concepts which gives him the ability to interpret the impression. In studying the eye, we have already seen that it is not a very easy process. Whatever a man can thus grasp *at a time* becomes to him his Space; and everything else is Time, which unfolds itself through motion. Now all motion is relative, and looked at from a point (our eye) it must necessarily be rotational in character, and be perceived only by a change in the relative position of objects in view. When we walk along a road, this change does take place, but we know in our head, that it is our body that is moving and not the houses, and we can apply the correction up to a point. But when we are moving in a fast train although we know equally well that we move, still the trees seem to run a race, overtaking each other and whole fields come to us, rotate round us and pass on. Because there is nothing else to compare

it with, when an aeroplane dips, it is the solid earth, which rushes up to meet it, and the Sun and starry heavens go round and round exalted "ME", on my speck of dust. We can think, can know and yet these changes following each other in quick succession leave us no time for applying the correction. How much more difficult must it be for an animal, which cannot *think*?

278. If we were horse?

If our reasoning is correct all animals except man would have a two-dimensional consciousness. They have a to and fro, and a right and left—only two directions in space. Everything else in the world exists for them in Time and they can get at it, only by going to and fro. Some images evoke a sense of pleasure out of the memory, others of pain; but to an animal each is a separate impression. A horse will learn to distinguish its house from a railway station, because the one is associated with food and shelter, while the other one is a very crowded place, full of noises and strange shrieks. Streets are known by places where it habitually stops, but for it each one is a different phenomenon, which recurs every day. Every day a new Sun rises for a cock, as it does to many very primitive savages; and when a cock crows it is not to rouse the Sun but to herald the birth of a new one. In a solar eclipse at ten in the morning, all birds will return to their nests, because it gets dark, and evening has come. As we have seen before, an animal can see only a flat world because we see no more, and it cannot "think" it

into a solid; and a circular disc and a sphere will be the same until it moves. The most curious result of this will be that whenever it moves, to its consciousness the whole world would appear to move. When it runs, it would be the street and the houses that rush in towards it very much like the dissolving views we have seen in a cinema, when the villain from a speck in the distance grows suddenly before us into a close-up. That is the sort of world animals live in. Every time a horse turns a street corner, it is the row of houses that rotates. If a horse approaches a sphere something would appear to come out of the point nearest to it, and move out quickly towards the circumference in all directions. This would not happen to the disc. It would be possible for a horse to get an idea of the velocity with which the stationary houses appear to move towards it, which is really its own velocity. But a rotating wheel would be something incomprehensible. Even if it stands quiet, the wheel would continue to turn, and this would look like making faces. To a horse therefore all objects which move in our opinion are something inexplicable, something "living." A kitten plays with its tail, which moves by itself and seems quite different from the table and chair. To bullocks a motor-car is a curious hissing animal, and a railway engine is a terrible snorting fiery horse. Even to man, a moving sign or S-H-E-L-L coming out in fiery letters out of darkness, are more fascinating than the most elaborately painted advertisement on the wall; but when we

"think" of it, well, they are both traps laid out for the unwary.

279. Three distinct stages; but why three only?

We have thus seen how the world would appear to an animalcule, which has only reflex actions, but no memory. An animal with better defined sensations and memory, can "perceive" a great deal more. To a man with his sensations, memory and reasoning, his power to form "conceptions" which he clothes in language, the world takes on an entirely different meaning. And yet the Universe in which the amaeba, the horse and man live is exactly the same. The first is conscious of only one dimension in Space "forwards and backwards". The second can in addition feel whether it is turning to the right or left. Man can imagine an up and down as well. The amaeba can thus be said to have a one-dimensional consciousnsss, the horse two and man three. Everything else that does not come within the creature's purview exists only in potentiality and requires Time for its unfoldment. We have seen how a horse would impute motion to perfectly stable objects, and even how a "thinking" man gets bowled over in a fast moving train. What guarantee is there that all the accurate measurements of our physicists, and the properties in Space which they ascribe to various objects are absolutely the last word? I have tried to show that these differences between the amaeba, horse and man are not questions of degree, but point to

sudden expansion of consciousness into different orders. One, two and three—why not a four-dimensional consciousness, or even five and so on to "n". Why not? But I must again point out that we are not talking of a one-dimensional world, as different from Hinton's flat land or our solid Universe. That way of thinking is useful to a certain extent but is very misleading. We all live in a world of "n" dimensions and it is only consciousness that is limited to one, two or three-dimensions of space, and everything that exists in the next higher dimension appears to us as Time, which as Einstein has shown is convertible into Space and *vice-versa*.

280. Gravitation the next key.

Supposing it is possible to expand our consciousness so as to include four-dimensions of Space, it will be useful to speculate in what direction this advance will lie. We are consciousness of three-dimensions, which means a volume, then density. That gives us the Mass and as all masses in our world attract each other we have gravitation and weight. All matter has mass and we do not know any that has no weight. So *our* three-dimensional world is bound up with gravitation; and Newton is our Real Master, and at the same time the tyrant, who limits our consciousness to three-dimensions. What is gravitation? It is presumably a force, but if its action was like that of positive and negative charges of electricity attracting each other, then the myriads of tons of rain we had during centuries past would have neutra-

lised the earth's weight by this time. No. Gravitation is not like that. It is a force; and it acts at a distance. How and why? We frankly do not know. It is only after Einstein has virtually dethroned Newton, that the attention of the modern scientist has been drawn to the problem; but many of our Rationalists who still swear by Darwin and Ingersoll have not yet heard of Einstein, Minoski or Ouspensky or even of Eddington,* a sane professor from Cambridge. These thinkers feel convinced that gravitation is a dynamical phenomenon, and that if they find a key to gravitation, they will unlock the fourth-dimension with it. It has been suggested that the whole Solar system (and perhaps the whole Universe) is like a huge Crookes vacuum-tube, with the Sun as the anode, at which the planets which act as cathodes are continually sending tremendous streams of electrons. It is now admitted that matter can break up into electrons, and if we are losing such large quantities every minute, obviously the same matter must be returning to the earth in some other manner yet unknown to us. Myriads of tons of matter getting in by the back-door, without our proud "Scientists" being aware of it!! All this may be quite true and useful; but again let me point out that what we are seeking is not a fourth dimension of

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Eddington; Space Time and Gravitation.
Nature of the Physical world.
(Cam. Uni. Press.)

Ouspensky: Tertium Organum (Kegan)
Brown: Mystery of Space (Kegan) etc.

matter, but an expansion of our consciousness—not mere growth.

281. End of all Time and Space.

Can we get any help from the despised rubbish heap of Religion? Let us try. We have already seen that we can correctly understand the properties of Space having one-dimension less than the one in which our consciousness can freely and properly function. This does not mean that we do not function in these dimensions. However flat and vapoury a three-dimensioned stone wall may appear to a horse, it will break its head all right. Similarly we too must be doing work in the four-dimensioned world, and breaking our heads against its wishy-washy boundaries. Only we are not fully conscious of it. What is it we know of which fulfils these conditions and yet is beyond three-dimensions, beyond gravitation? We have always admitted the notion of Mass independent of weight. Can the possible be real? What we want is mass without weight? Religion tells us that "Thought" is as much a fact as steel. It does not obey Newton, but it too has its Laws, of which perhaps Newton's Laws are a partial exposition. Have we not seen how powerful our emotions are, and how the "morale" of an army counts more than the equipment? The medium through which thoughts propagate in four directions, is perhaps what we call thought-stuff; and Poets and Prophets who deal in those airy-fairy goods are perhaps more practical than those who swear by gold. And have not our old Sages left for

us enough guidance in books like Patanjali's Yoga-sutras? If the development of four-dimensional consciousness means annihilation of gravitation and the breaking up of the atom, is it surprising that those Guardians of humanity are rather unwilling to confer the fourth expansion of consciousness on a person until he understands that All Life is One, and has shown by his actions that he has already made that a guiding principle in his Life. Our emotions and the Laws of morality work in four-dimensions, and perhaps Reason works in five. Above reason, the jiva or the real Inner Man works in six-dimensions. Every increase in dimensions of Space means a corresponding encroachment on the domains of Time. Time and motion are possible only as long as there are two points "from and to," but if at the seventh or "n^{th}" expansion Consciousness pervades every point in the Universe, there will be no motion, no time and perhaps no Space itself. We are told that God so pervades the whole Universe; and the last stage may be appropriately called God-consciousness, where everything vanishes and only He exists. It is, we are told, like a circle with centre everywhere and circumference nowhere, and an Eternal Now. When we reach that stage and the Sages tell us that the tiniest ants will do so, we shall all have a good laugh, if that is possible and exist as Pure Being and Bliss. In the meantime will it not be wiser not to laugh at that possibility and try to understand *if such things can be?*